DOCUMENT RESUME

ED 184 994 SP 015 491

TITLE	Year Book 1978. Reports of Physical Culture and Health 24.
INSTITUTION	Research Inst. of Physical Culture and Health, Jyvaskyla (Finland).
REPORT NO	ISBN-951-790-024-4
PUB DATE	79
NOTE	95p.
EDRS PRICE	MF01/PC04 Plus Postage.
DESCRIPTORS	Athletes; Athletics; Curriculum Design; *Educational Objectives; Foreign Countries; Performance Factors; *Physical Education; *Physical Fitness; *Public Health
IDENTIFIERS	*Finland

ABSTRACT

The organization, functions, and work of the Research Institute of Physical Culture and Health, and the Research Unit for Sport and Physical Fitness, both functioning at the premises of the Foundation of Physical Culture and Health in Jyvaskyla, Finland, are discussed. Research papers which have been presented at international congresses during 1978 are included to show the focuses of different research projects being conducted at the Foundation. The publication closes with abstracts on the reports published in the Institute's publication series. (JD)

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SP 015 491

LIIKUNNAN JA KANSANTERVEYDEN JULKAISUJA 24

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RESEARCH INSTITUTE
OF PHYSICAL CULTURE AND HEALTH

Jyväskylä, Finland

YEAR BOOK 1978

Reports of Physical Culture and Health 24

Jyväskylä 1979

Liikunnan ja Kansanterveyden Edistämissäätiön Tutkimuslaitos
The Research Institute of Physical Culture and Health
Viimahallin alue, 40100 Jyväskylä 10, Finland

ISBN 951-790-024-4

FOREWORD

The purpose of this publication is to throw light on the research work of the Research Institute of Physical Culture and Health and the Research Unit for Sport and Physical Fitness, both functioning at the premises of the Foundation of Physical Culture and Health in Jyväskylä, Finland.
The organization and functions will first be briefly discussed. Then research papers, which have been given at international congresses during 1978, are published to represent different research projects. They are completed with two articles.
The publication is closed with abstracts on the reports published in the Institute's publication series.

Majority of the Institute's and the Research Unit's studies have been published in Finnish, which means that this report represents only a part of the projects' publications. Because, however, it lend an overall picture of the research activities, we take the liberty of calling it our second Year Book the first one being published last year covering international congress papers of the year 1977.

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Pauli Vuolle & Markku Vainikka

SCIENTIFIC WORK IN THE FOUNDATION FOR PROMOTION OF PHYSICAL CULTURE AND HEALTH

The purpose of the Foundation is to promote physical culture and public health in Finland and to support scientific research in these areas. There are two research units in the Foundation: the Research Institute of Physical Culture and Health, established in 1970, and the Research Unit for Sport and Physical Fitness, established in 1975.

The aim of the Institute is to produce, acquire and pass on information connected with the health and welfare of man. In order to implement these aims work at the Institute has progressed along three fronts: research proper, service work and information service (figure 1.).

The aim of the Unit is to produce, acquire and pass on information connected with physical fitness, physical capability and sports. The working fronts of the Unit are the same as at the Institute (figure 1.).

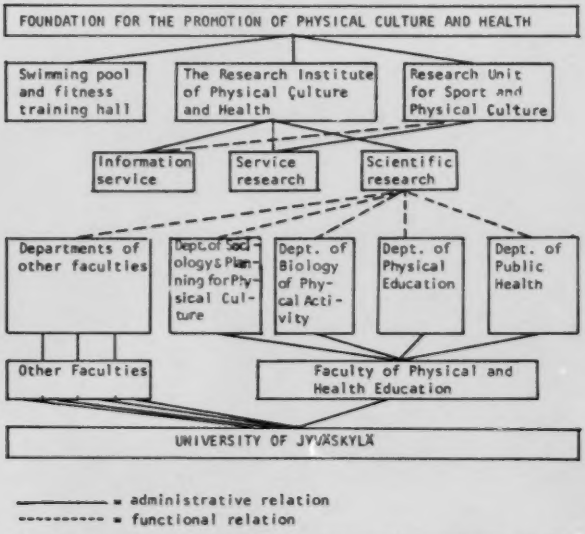
FOUNDATION FOR THE PROMOTION OF PHYSICAL CULTURE AND HEALTH
Swimming pool and fitness training hall
The Research Institute of Physical Culture and Health
Research Unit for Sport and Physical Culture
Information service
Service research
Scientific research
Departments of other faculties
Dept. of Sociology & Planning for Physical Culture
Dept. of Biology of Physical Activity
Dept. of Physical Education
Dept. of Public Health
Other Faculties
Faculty of Physical and Health Education
UNIVERSITY OF JYVÄSKYLÄ
= administrative relation
= functional relation

FIGURE 1. Organization of the Research Institute of Physical Culture and Health and the Research Unit for Sport and Physical Culture and collaboration with the University of Jyväskylä.

Research in both units is carried out in close collaboration with each other and the departments at the Faculty of Physical and Health Education and some other departments at the University of Jyväskylä.

The work of the Research Institute and the Research Unit is financed by the Ministry of Education with the exception of service research. The research has been done on the premises of the Faculty of Physical and Health Education at the University of Jyväskylä, whereas the Information Service operates from the Jyväskylä University Library. There have been plans for a research institute building. In recent years there have been two people employed full time in the information service, and in both unit one to three researchers and two to four other members of staff engaged in research.

The Research Institute is concerned on the study of physical activity and motivation for sports among young and adult people and, on the other hand, on the problem areas of physical education and socialization. There are three main research projects going on: 1) research on physical education of preschool children, 2) research on school physical education, and 3) research on the population's sports behavior. In addition, there are two other large research projects, 4) socialization into sport involvement (an international study) and 5) METELI-project: Working conditions, state of health and physical activity in the machine industry.

Service research at the Institute has chiefly comprised the making of investigations and plans for the use of various bodies and has been financed by the client. The service research department has made e.g. a functional plan for a sports college, a plan for school sports facilities, and sports plan for a town with the associated investigation.

The Information Service of the Institute is responsible and takes charge of information service in physical education and sports sciences under the concern of Ministry of Education. In Finland, information is collected, selected, documented and relayed of foreign and Finnish publications and, respectively, to foreign countries of Finnish publications. Information is mainly disseminated as reference lists, some times as abstracts, and often as literature reviews in Finnish periodicals. Information is selected and disseminated on the basis of scientific main areas priorized by a state body.

The scientific work of the Research Unit for Sport and Physical Fitness is concentrated on studing a) the physical fitness of young people and top athletes,and b) the connections between physical fitness and health. The main projects of the Unit are at present 1) research on the physical fitness and sports behavior of young Finnish men before, during and after conscription, 2) research on the endurance capacity and exercise of Finnish top skiers and 3) research on the effects of pause gymnastics on the physical fitness, sports behavior and school alertness of pupils. In corporation with the Institute, the Unit has research on the effects of the tests of physical fitness on the sports behavior of population and in corporation with the Rehabilitation and Motion Center Peurunka research on the physical rehabilitation of the spinal cord injuried men.

Service research of the Unit consists of the physical examinations and the physical fitness tests of sportsmen as well as other people. The most important service research concerns at present the tests of Finland's ice-hockey team.

Martti Silvennoinen

ON THE PRINCIPLES OF DEVELOPING AND COMPARING OBJECTIVE AND CONTENT STRUCTURES IN PHYSICAL EDUCATION WITH SPECIAL REFERENCE TO THE FINNISH COMPREHENSIVE SCHOOL CURRICULUM

International Seminar on Comparative Physical Education and Sport
Wingate, Israel, 26.12.1978-1.1.1979.

1. INTRODUCTION

In 1970 there appeared in Finland two committee reports outlining the curriculum for the 9-year comprehensive school. The first report presents the general principles of the new school and the second report spells out the syllabuses for different school subjects. The reports were followed by public discussion as well as research and experimentation. Many critical remarks were also made.

The general outlook of the new comprehensive school (grades 1 to 6 constitute the lower stage and grades 7 to 9 the upper stage) as well as that of later educational levels reflected largely the views of western market economies in the 1960's regarding the ensuring of economic growth by paying more attention to the quality of education and to educational objectives when the quantitative extension of educational services proved insufficient (e.g. Finnish Committee on Educational Structure 1969; The 1971 Education Committee). Swedish experiences were heavily drawn on in the work of the comprehensive school curriculum committee.

At the same time there appeared in Europe also tendencies to do away with selective school systems (OECD 1967) and essentially similar views of the future learning society were presented. Such a society would, according to a Unesco committee (1972), be characterized by scientific humanism, creativity, social commitment and personality development towards a complete man.

The comprehensive school curricula have been criticized, for instance, for the evident gap between the overarching aims and the subject-wise syllabuses, for the vague ideological background of goal definition and of the entire educational reform, and for the vague or lacking definition of common educational goals for different levels of education (e.g. Hakkarainen 1972, 1973, 1977; Malinen 1974). It has also been said that there is too little hierarchy in the definition of goals, which may lead to a view according to which all goals are equally important (Hakkarainen 1972). References to long-range and short-range objectives are few (Malinen 1974) and there is no clear interpretation of how the goals can be applied in practical teaching. Malinen has summarized the situation as follows: "the more binding a goal should be the more vaguely it has been expressed, and the more exactly objectives have been defined the less binding they are wished to be seen".

2. GOALS OF PHYSICAL EDUCATION

Physical education, as well as all other school subjects, should contribute to the fulfilment of the general educational aims of the comprehensive school. The overall educational aims and the specific objectives of physical education are presented in Figure 1.

The role of physical education is important especially in sectors 1 and 3 of the overall educational aims.

The most central objectives in the hierarchy of physical education objectives are at present considered to be 1) maintaining and improving pupils' physical fitness and 2) providing opportunities and stimuli for the creation of a permanent personal interest in physical activity.

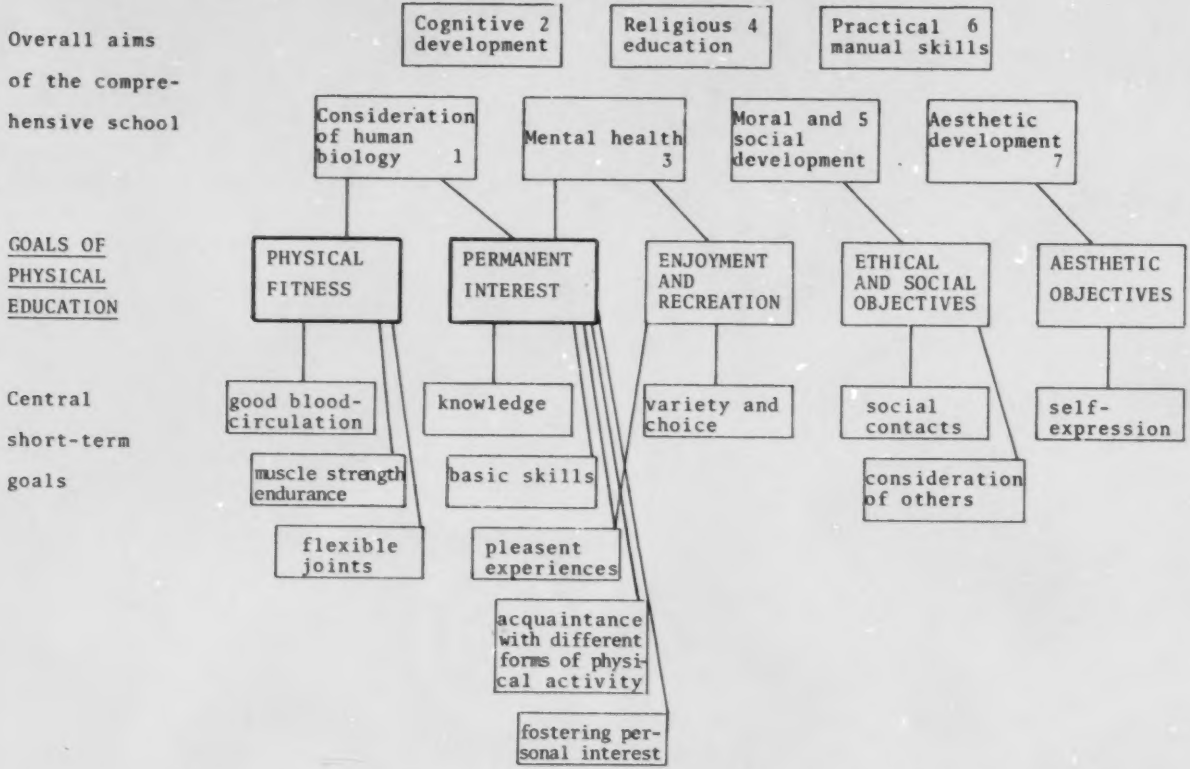

FIGURE 1. Overall aims of the comprehensive school and the hierarchy of the goals of physical education.

3. SOME VIEWS ON THE DEVELOPMENT OF THE PHYSICAL EDUCATION SYLLABUS

3.1. International perspective

Nupponen and Vehviläinen (1975) analyzed the objectives of primary school physical education in 26 countries on the basis of a review made by ICHPER and UNESCO in 1969. The objectives were classified as follows: 1) social and ethical objectives (individual vs. society, personality, temperament), 2) affective objectives (aesthetic activities, permanent interest, enjoyment and recreation), 3) psychomotor objectives (fitness, skills, health), and 4) cognitive objectives (knowledge, understanding).

Nupponen and Vehviläinen found that most of the objectives of physical education understandably enough fell within the psychomotor domain and after that came the social-ethical domain and the affective domain. Most frequently were mentioned fitness and skill objectives. The objective of permanent personal interest in physical activity was the most commonly emphasized objective in the affective domain (see also Figure 1). Health objectives were mentioned only by 14 countries and manysided health objectives (eg. mental health and hygiene) only in eight countries. Clearly the least common category was esthetic education and creativity within the affective domain (7 countries). In comparing the development of physical education objectives from the earlier primary school curriculum to the 1970 comprehensive school curriculum they found a clear shift in the social area from an emphasis on order and discipline towards establishing and developing social contacts.

Clear differences between countries are seen also in views on how physical activity in physical education should be guided and what readinesses are selected for development. Extremes are represented on the one hand by systems that are identical with the various forms of competitive sports and on the other hand by systems based on a variety of motor exercises without clear links with traditional sport events. The latter type would be exemplified by a system which starts with a gradual development of motor performance and proceeds to the physical and psychic command and understanding of motor behavior in the most varied and ever-changing situations (A definition of physical education 1975). Neither of the two approaches can exclude the other although it might easily be thought

that the latter systems would prepare children and youth better for the various physical and motor situations in everyday life.

3.2. Structuring pedagogical objectives

Malinen (1974, 30-31) has suggested the use of the concepts "long-range objectives", "short-range objectives", and "basic objectives" in the development of a systematic goal structure of the whole curriculum. Basic objectives are short-range objectives common to all pupils and subject matter related to common objectives would be "core subject matter", whose teaching to all pupils should be guaranteed by centrally taken measures.

Basic objectives should contain such cognitive abilities that are indispensible for knowledge acquisition and for functioning in the society, and such activities that help to safeguard survival and increase the possibilities for a balanced development, as well as such stimuli that are considered important to all people.

From the point of view of the functioning of the curriculum it is of central importance how manysided and detailed objectives are defined, when objectives refer to distinct performances or overt responses (product criterion) and when objectives are equated with the presentation of a given set of stimuli and all are not expected to respond in the same way. The stimulus approach to teaching is usual in the same case of expressive objectives. Their purpose is to offer all pupils common experiences, opportunities (process objective) but nothing is said about what should be learned. Process objectives then never solve the problem of the acquisition of permanent characteristics.

Figure 2 illustrates how harmonious personality, which is the goal of the Finnish comprehensive school, might serve as the basis of pedagogical objectives.

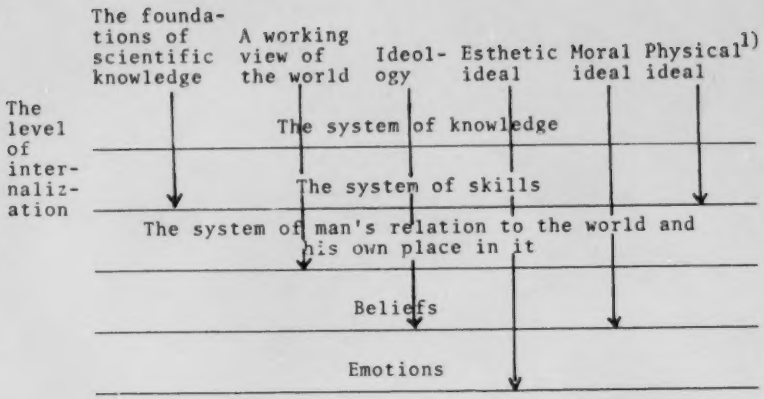

FIGURE 2. The subareas of personality development (pedagogical categorization) after Hakkarainen (1977).

Harmonious personality set as the overall aim of education has to be viewed as a whole consisting of different ideals. They are social view of what is desirable personality in a given society and at a given stage of social development.

The importance of the school lies in that each pupil should form personal ideals which correspond to the social ideals. In order to make it possible to transform social views of education into pedagogical objectives it is necessary to define a specific system of knowledge for each subarea, of personality development and a list of skills and knowledge necessary for pupils to be able to follow instructions.

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1) The stopping of the ideal of physical education at the second level of internalization does not by any means suggest that e.g. emotions are not important in the physical domain.

3.3. Structure of physical education objectives

In Figure 3 is presented a model of how each stage of social development is reflected also on the important phases of goal setting and content selection.

It can be said that what is considered to be desirable educational ideal at any period of time, irrespective of whether it is clearly structured or not, is also conveyed to the area of physical education and thus to different sectors of pedagogical activity influencing views of their relative order of importance.

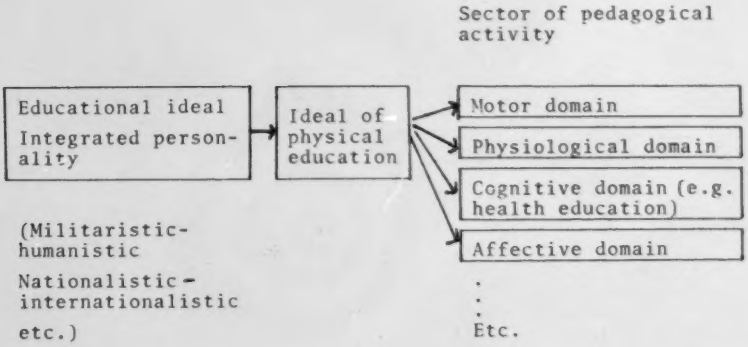

FIGURE 3. Important conceptual areas in the derivation of the objectives of pedagogical activity from general educational and physical ideals.

The ideal of Finnish physical education is still unstructured and conflicting in the case of the comprehensive school. As an aside it can be noted that the physical ideal and the objectives of pedagogical sectors have from time to time been characterized by strong militaristic views. Similarly it can be noted that the problem of the ideal of physical education (harmony of body and soul) was prominent in the thinking of the pioneers of Finnish physical education and sports, towards the end of last century but interest in such questions has gradually diminished after their time. At the present moment the need of reassessment derives mainly from the advance of curriculum theory and research.

In the various sectors of pedagogical activity the dominance of physical fitness (muscle strength, endurance) has recently been pointed out (see Fig. 1). However, school physical education would seem to have rather limited opportunities of improving pupils' physical fitness. If physical education in schools were to focus effectively on physical fitness, it would simultaneuously become alarming onesided. The dominance of physical fitness is understandable since development is easy to monitor and measure. Another explanation for the prominence of physical fitness is based on the assertions frequently heard in the 1960's concerning the rapid deterioration of the physical fitness of the youth. Surveys and studies have not, however, given consistent support to such assertions.

A large survey of the physical performance capacity of comprehensive and senior secondary school pupils carried out in 1976 showed that measured with an international fitness test Finnish pupils did better on strength performance than children in some other countries but worse on speed performance. Decisive decline fitness level has not occured although a slight downward trend could be found (Nupponen 1978).

To the need reassessment of the sectors of pedagogical activity has also contributed the weak position of the motor domain in the goal structure (see Fig. 1). Several studies carried out in Finland and in other countries have shown that the development of motor skills before school age (early education, day nurseries) is important for manysided physical experiences and for the development of physical performance.

The position of the objectives of a permanent interest in physical activity in the present structure of the curriculum is essentially frustrating as an implicit product objective. The assessment if its realization during school age is impossible and without proper linkage with the cognitive domain it has no real foundation. Extensive data on the comprehensive school pupils' interest in physical activity collected in 1977 shows a clear decline after the age of 12.5-13 years (Silvennoinen 1978). Another extensive data on adult population (METELI 1975) shows that adults' interest in pnysical activity is dependent on their occupational position, the nature of their work and on many other

environmental factors external to school. The best guarantee of a permanent interest is probably the cognitive internalization of personal physical activity and therefore activities advancing motor and physiological performance should be supplemented with cognitive subject matter, which guides for instance health habits. This would at the same time strengthen the position of the cognitive sector of physical education in general. Health is an interesting area insofar as contents that guide pupils towards healthy habits of life can be taught both by cognitive and physical means.

The knots of Finnish physical education should be untied by structuring in detail the physical ideal and then its cognitive and skill sectors and by ensuring that the subject matter in the motor domain is many-sided enough. Present-day teaching reflects the dominance of ball games and team games, which is revealed in teachers reports (Nupponen 1978) and also particularly clearly in pupils' leisure and physical activity preferences (Silvennoinen 1978).

Research should also be directed to other than the most central goal areas. Empirically oriented educational sciences would with benefit drawn upon the aspirations to develop the moral and esthetical elements of physical education and studies of its effects.

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Lauri Laakso & Keijo Häkkinen

ON THE RELATION OF PHYSICAL EDUCATION STUDENTS' TIME USE TO CHANGES IN THEIR MOTIVES FOR CAREER CHOICE

International Scientific Conference
"Personality of a Physical Education Teacher"
Olomouc, Czechoslovakia, 17-22.9.1978

1. INTRODUCTION

Higher education in sport and physical education in Finland has been concentrated to one place, namely the Faculty of Health and Physical Education at the University of Jyväskylä. Since 1972 physical education teachers have also been trained only at the Faculty. Thus it is relatively easy to obtain data on Finnish P.E. teachers during their basic preservice training but in spite of that there have been relatively few studies of P.E. students and particularly few longitudinal studies aiming to find out changes that take place during studies (Tiainen 1976).

Also the research reported here started as a cross-section study whose purpose was to describe the motives for career choice and attitudes towards physical education of P.E. teacher candidates (Laakso 1975). The results showed that at the early stage of their studies P.E. students were more interested in developing their own athletic skills than they were in educational or scientific questions. For this reason, it was decided to study what changes take place in the students' motives during the three years of study. Obviously the situation towards the end of studies is not the same as when the choice was being made, but it may be of some relevance for one's practical work as a P.E. teacher, what one's motives for the future profession are at the end of undergraduate studies.

The motives during the final stages of studies are influenced partly by the students' motives on entering the Faculty and partly by the time spent on active studies there (e.g. Viljanen 1977). Furthermore, the motivational and attitudinal background at the early stages of studies partly determines how the students spend their time and energy during studies, which again reflects back on their attitudes and motives. Consequently it was intended to study also whether students' use of time is associated with changes in motives.

2. METHODS

The subjects were 75 P.E. students who entered the Faculty in 1973 and 71 of whom took part in the second measurement in 1976. Two students interrupted their studies and two could not be reached.

The first measurement took place in autumn 1973 after the beginning of studies and the second measurement towards the end of studies in spring 1976.

The measurements consisted of a questionnaire administered to a group. Items measuring motives for career choice and attitudes were constructed on the basis of instruments employed by Karvonen (1970) and Tiainen (1973). In the study of time use the students were asked to estimate their average use of time on voluntary studies in the Faculty of Health and Physical Education and in other faculties, on gainful employment and on participation in different leisure time activities.

3. RESULTS

3.1. Changes in career choice motives

The statements regarding career choice motives were grouped into scales by means of factor analysis. After that changes in motives were studied factor by factor. In Table 1 there are presented distributions which show, to how many students each motive was at least of some significance from the point of view of one's future occupation as a P.E. teacher. The significance of practically all motives had decreased to some extent during studies. This is understandable, because motivation for one's future occupation and for studies is likely to be highest at the early stages of studies when one has just chosen one's major subject.

TABLE 1. Changes in the career choice motives of P.E. students (The figures indicate what percentage of students considered each motive at least to some extent important from the point of view of their P.E. teacher career)

	MEN (N=28)			WOMEN (N=43)		
	1973 %	1976 %	p	1973 %	1976 %	p
Theoretical orientation and motivation						
Interest in sport-scientific books and journals	19	23	-	35	26	-
P.E. teacher degree is a good starting point for further studies	92	50	<.001	69	38	<.01
Interest in organizing physical exercise which serves the majority of people's physical fitness	69	81	-	91	95	-
For P.E. teacher it is also necessary to know statistical methods	58	23	<.01	52	43	-
Pedagogical orientation and motivation						
Desire to help children and youth*)	44	40	-	56	35	-
Interest in utilizing audiovisual aids to demonstrate movements	65	81	-	53	86	<.01
Desire to co-operate with pupils and their parents	69	92	<.05	72	93	<.05
Athletic orientation and motivation						
Interest in developing one's athletic talents*)	56	40	-	70	28	<.001
P.E. teacher can promote our country's success in international competitions	70	63	-	65	35	<.01
Interest in different sport events and results	77	63	-	84	93	-
P.E. teacher's task is to help educate patriotic citizens	30	30	-	24	17	-
P.E. teachers task is to find out talented athletes	81	81	-	70	70	-
Instrumental orientation and motivation						
Relatively short time to study	52	67	-	58	56	-
P.E. teacher has long holidays	85	92	-	88	84	-
Relatively low study expences	37	4	<.01	40	11	<.01
The position of P.E. teacher is economically secure	82	52	<.05	68	42	<.05
Prestige orientation and motivation						
P.E. teacher's job commands general respect	59	52	-	36	33	-
P.E. teacher's certificate gives one qualification for several other occupations as well	51	43	-	63	30	<.01
P.E. teachers often take a leading role in various pursuits	63	38	-	60	45	-

*) The figures indicate how many per cent of students considered the motive at least important from the point of view of their P.E. teacher career.

Only pedagogical orientation (i.e. desire to help children and young people, willingness to cooperate with pupils and their parents, willingness to use AV-aids in teaching) had strengthened to some extent both among male and female students.

Interest in the theoretical aspects of physical education studies (interest in scientific books, statistics, post-graduate studies and in physical fitness) had gone down during studies somewhat more among male students than among female students.

Competitive sport orientation (continuing one's sport career, seeking internationa success, willingness to coach talented young athletes and interest in sport meetings as well as in patriotism) had diminished significantly only among female students, while there had been no change among male students. Instrumental motivation (interest in the P.E. teacher career on account of economic benefits, long holidays or short study time) had decreased considerably both among females and males, whereas prestige-oriented view (valuation of the occupation, wish to acquire through sport a leading position also in other fields) had weakened among female students but not among male students.

3.2. Relationship between time use and motivation

Correlational analysis was used to study how the attitudes and motives at the early stage of studies were related to subsequent time expenditure during the studies, which describes the effect of attitudes and motives on behavior during university studies (Table 2). Theoretical interest in physical education studies seemed to be related to voluntary studies in other faculties and to radio listening and art activities during leisure. There was a significant negative correlation between theoretical interest and participation in competitive sport. Pedagogical orientation was significantly related only to voluntary studies in the Faculty of Education. Orientation towards competitive sport was naturally associated with participation in sport contests and it correlated negatively with artistic pursuits.

TABLE 2. Significant correlations of career choice motives and attitudes towards physical education with variables of time use during university studies.

FORMS OF TIME EXPENDITURE	Theoretical orientation and motivation for P.E. studies
	r
Voluntary study in other faculties	.34
Listening to radio	.27
Artistic activities (theatre, art exhibitions, concerts, etc.)	.26
Competitive sport	-.26
	Pedagogical orientation and motivation
Study at the Faculty of Education	.27
	Competitive sport orientation and motivation
Competitive sport	.57
Artistic activities	-.29
	Instrumental motivation
Study at the Faculty of Social Sciences	-.30
Physical exercise during leisure time	.30
	Prestige-orientation and motivation
Religious pursuits	.27
Spectator sport during leisure	.23

Instrumental motivation for physical education studies was negatively related to studies of social sciences and positively associated with physical exercise during leisure time. An interesting result was obtained also when it was studied how prestige-oriented motivation (i.e. a high valuation of the P.E. teacher's social status) was related to time expenditure. Such an attitude was significantly related to religious activities and to spectator sport.

The central motive statements of each scale were also cross-tabulated with variables describing time use. The number of cases remained rather small but this gave some idea of to what extent motivation at the end of university studies has been influenced by early motivation and by time expenditure during studies. It was found, among other things, that interest in continuing one's sport career, which generally had decreased during studies, was even lower among those students who had pursued voluntary studies in other faculties (Table 3). On the other hand

TABLE 3. Interest in continuing one's own sport career at the beginning and end of studies in relation to voluntary studies in other faculties.

		EARLY STAGE OF STUDIES			
		Not interested in continuing one's sport career		Interested in continuing one's sport career	
		Does not study in other faculties (N=7) %	Studies in other faculties (N=17) %	Does not study in other faculties (N=26) %	Studies in other faculties (N=18) %
FINAL STAGE OF STUDIES	Not interested in continuing one's sport career	71	100	50	61
	Interested in continuing one's sport career	29	0	50	39
		100	100	100	100

the limitation of studies only to the Faculty of Health and Physical Education was in some cases related to an increase of competitive sport orientation. Therefore, although motivation during the early stage of studies was significant for time expenditure during studies, there is obviously also an opposite link from time use during studies to the students' attitudes and motivation. The same result was rather consistently observed when other motives and forms of time use were studied. The only statistically significant relationship besides the one mentioned in the foregoing was the fact that study in other faculties helped to preserve a theoretical orientation to P.E. studies better than limitation of studies only to the Faculty of Health and Physical Education.

4. DISCUSSION

It appeared that almost all career choice motives had lost some of their significance during university studies. The result may partly be due to the fact that towards the end of studies career choice is no longer as topical as when studies were started and consequently motives do not appear equally clear.

Differences in the amount of decrease between different motives do, however, to a certain extent illustrate change in students' views during university studies. Thus, for example, the stability or even strengthening of pedagogical motivation when at the same time there was a significant decrease in instrumental and prestige-oriented motives can be taken to suggest that faculty teaching aiming at pedagogical orientation had not been quite unsuccesful. The diminishing of scientific and theoretical interest is, however, against the set goals and the weakening of competitive sport orientation is also an ambivalent point.

On the one hand interest in competitive sport and coaching is of some use to a P.E. teacher but on the other hand excessive interest in one's own athletic career may jeopardize the attainment of other goals of university studies. Since the motive of continuing one's athletic career was the second most important at the beginning of studies, slight decrease in it is hardly detrimental, especially since interest in athletic career diminishes with age also among other people and not only among physical education students.

Although changes in motivation in the main reflected the goals of P.E. teacher training, the results of the study cannot be considered optimal for the Faculty. First of all it appeared that motivation created before university studies remains fairly stable during them. Therefore, if teacher motivation is considered important for teaching, a more effective measure than training might be to take career choice motives into account in the faculty entrance examination. At the moment there are no motivation or attitude measurements in the entrance examination. Another important finding for the Faculty was that changes in harmony with the educational goals of the Faculty were to a significant extent explained by studies in other faculties. This result seems to suggest that in order to effect changes in motivation towards pedagogical and theoretical orientation it is important for the Faculty to get support from other faculties or to include a greater dose of "general" or "liberal" studies in its own educational programme.

The results now reported described the situation of only one student cohort. The number of subjects was quite small and the generalizability of the results is for the time being uncertain. The results indicated, however, that larger and more thorough studies of P.E. students' motives for career choice are useful and needed for developing the educational programme and they will be continued. Perhaps the greatest weakness of such studies is, however, that the study is limited only to the period of basic preservice studies. How stable the motives

found during the preservice studies are and to what extent the effects of training are felt after them, are questions that can be answered only if the study is extented to practising teachers. From the point of view of further studies of motivation it would be interesting to know if so-called conscious motives that have been measured also in the present study are really related to P.E. teachers' actual teaching behavior, which after all is the ultimate criterion of the success of teacher education.

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Lauri Laakso & Risto Telama

SPORT ACTIVITIES OF FINNISH YOUTH WITH SPECIAL REFERENCE TO YOUNG SCHOOL LEAVERS

Council of Europe, Committee for the Development of Sport
"Sport for Young School Leavers" Seminar
Stockholm, Bosön, Sweden, 9-13.10.1978

1. FINNISH SCHOOL SYSTEM

A significant change in the educational system has taken place in Finland in the 1970's, namely a transition from a dual school system to a uniform comprehensive type basic school. The new system has been introduced gradually and the last areas made the transition only last year. Consequently data about how the new school system functions are rather limited and preliminary.

Children begin the new basic school at the age of 7 and it lasts 9 years, so most pupils leave school when they are about 16 years old. After the basic school pupils have several options, the most important being (a) entering the senior secondary school, which leads to university studies, (b) entering a vocational school, and (c) ending their formal education and seeking a job. The comprehensive school is divided into two stages: the first cycle comprises forms 1 to 6 where teaching is mainly given by class teachers and the second cycle comprises forms 7 to 9 where teacher are subject specialists. The timetable of the first cycle contains 3 lessons a week in physical education and that of the second cycle 2 lessons. The weekly number of P.E. lessons in the senior secondary school (which lasts three years) is 2 to 3 and in most

vocational schools 1 to 2. Commercial school syllabus includes 2 lessons a week but most other vocational schools have no P.E. in the syllabus. In the reform of secondary level education, to be implemented in 2-3 years, P.E. has been introduced into all forms of secondary education.

When about 30 % of the pupils this time enter the senior secondary school and about 30 % in vocational schools and about 5 % in commercial schools it means that about 65 % of the age group will be within the reach of physical education after the basic school. On the other hand, most of the pupils who enter other educational institutions and about 30 % of the age group who leave the school are not affected by physical education after the basic school. It is possible to draw some tentative research-based conclusions about how this affects their interest in physical activity during leisure although research on this particular problem is scarce.

2. CENTRAL VARIABLES OF SPORT INTEREST

The central variables of interest in physical activity can be summarized as follows:

Level of manifest (overt) behavior	Active interest
	Primary participation - frequency of activity - amount of activity eg. time use, energy consumption - intensity of participation - object of participation forms of sport and physical activity - participation in organized activities
	Secondary participation - spectator sports on the spot through TV, radio through press
Level of latent (covert) behavior	Attitudes eg. towards P.E. in schools
	Motives

3. CHANGES IN INTEREST IN PHYSICAL ACTIVITY WITH INCREASING AGE

All research that can be presented here are cross-sectional ones, so it is not possible to give a "pure" account of development during successive periods of age. Differences between age-cohorts are likely to be fairly small among pupils especially when compared to differences between different age levels.

The number of active participants in physical activity changes with age so that the amount of active participants is highest at the age of about 12 years, after which it decreases. Among girls the decrease at the age of puberty is bigger than among boys.

Frequency of physical activity changes with age so that greatest changes are observed in the number of persons who exercise daily. The number of those who exercise regularly (2-6 times a week) stays roughly the same with increasing age. The number of persons who exercise once a week or less often increases with age. Thus the number of those who are totally passive with regard to physical exercise does not increase much with age (Telama 1978). In a somewhat older study, which dealt only with secondary school pupils, it found that the time spent on physical activity also decreases with age, more among boys than among girls (Telama 1972). While time spent on physical activity decreases, time spent on homework and other interests and leisure pursuits increases.

It is an interesting observation that although the number of active participants in physical activity goes down with age, there is an increase in the number of persons whose interest in physical exercise is intensive resulting perspiration and breathlessness (Telama 1978).

Also participation in organized sport and physical activity decreases with age. Differences in membership of sport clubs between age categories are small but participation in the activities of clubs decreases clearly with age - slightly more among girls than among boys. Similarly, the number of pupils who participate in the sport clubs of schools and in competitions goes down.

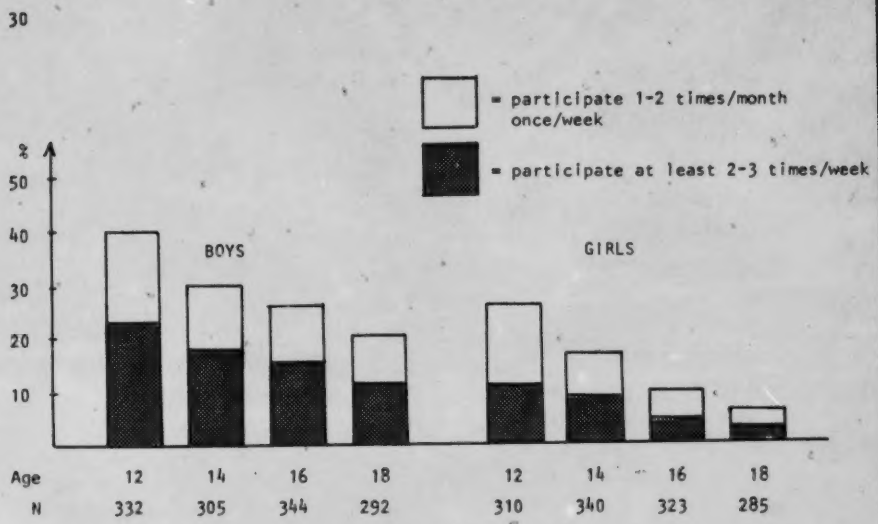

FIGURE 1. Participation in trainings of sport club (Rimpelä & al. 1978).

Changes in participation in different sport activities with age vary to some extent (Yearbook 1977). Activity decreases most in such competitive ball games as football, ice hockey, and baseball and among individual sports it decreases most in skating, skiing, track and field, and among boys cycling. Such forms of sport and physical activity which do not show variation of active participation with age are jogging in summer and winter, exercise at home, swimming, volley ball, and girls' cycling. A slight increase of activity with age is observed in walking and among boys in weight-lifting.

4. CHANGES IN ATTITUDE AND MOTIVES

When changes in motives for physical activity were measured with simple statements of motives, a systematic age difference was observed such that younger pupils stress the significance of motive for their personal physical activity more than older pupils. However, there were also motives whose generality increases with age. Such are eg. recreation and relaxation, enjoyment and pleasure, and counterbalance to school work. The first two motives are typically expressive and related to physical activity

itself. Motive statements whose significance decreases with age are related e.g. to competitive motivation and to the improvement of self-confidence. Other motives that lose some of their importance with age are getting new friends, keeping one's health, learning new skills, developing speed and elasticity. Motives, whose generality remains about the same with increasing age, are e.g. being able to be outdoors, being able to meet friends, developing muscle strength and endurance, improving alertness in school and improving one's figure (Silvennoinen 1978).

Attitudes towards P.E. in school do not change very much during school age. The number of those who get some or much enjoyment from P.E. even increases with age to some extent. Similarly increases with age the number of those who would take part in P.E. lessons even though they were not obligatory.

5. SPORT ACTIVITIES OF YOUTH IN DIFFERENT SOCIAL GROUPS

Also several variables other than age and sex have been studied to see how various background variables are related to the physical activity of the Finnish youth. Social class defined on the basis of father's occupation has been found to be related to physical activity so that children of fathers in a leading position are most active in physical exercise and children and youth belonging to the working class are the least active. Children and youth who come from a lower middle class (clerical) and farming background are located in between. Among girls the differences between different social classes are similar in all age categories even if the differences are the greatest just at the age of 14, when there occurs a drastic decrease in girls' physical activity. Among boys the differences between social classes are also the most distinct at the age of 14 and after that the differences get less prominent and finally disappear totally so that at the age 18 there are no differences in the physical activity of boys who come from different social classes.

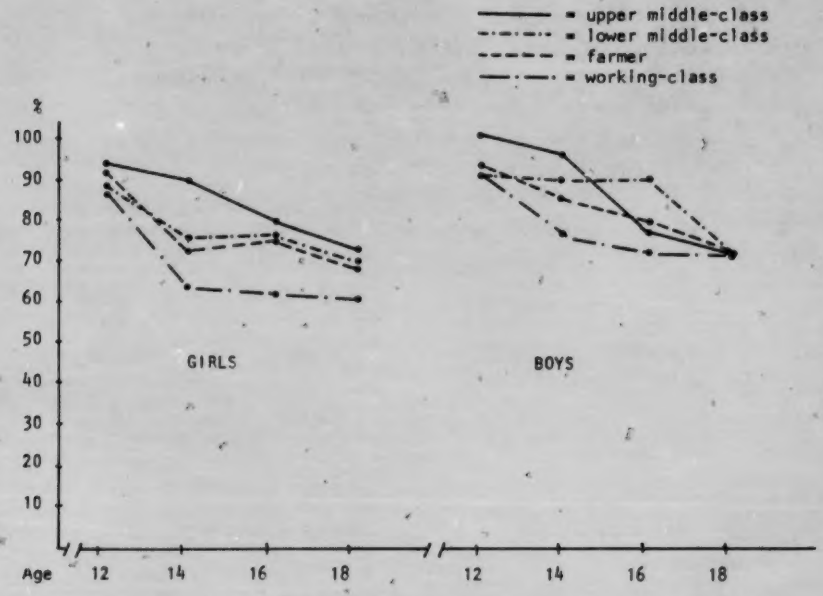

FIGURE 2. Sport participation of different social classes.

Social class has been found to be related to the quality of young people's physical activity also in Finland, and in this respect the results are in agreement with findings in some other countries according to which typical upper class sports are e.g. tennis, riding, sailing and bowling, while typical lower class sports are weight-lifting, wrestling, boxing, and volley ball (Telama 1970).

Place of residence has also been found to be to some extent related especially to girls' physical activity so that in largest towns the girls are physically most active while girls' physical activity is least common in eastern and northern Finland, which are typically underdeveloped regions, and this holds true of practically all age groups. Among boys the differences are not equally clear and they also vary from one age category to another (Rimpelä & al. 1978).

6. SCHOOLING AND LEISURE TIME PHYSICAL ACTIVITY OF YOUTH

Questions connected with schooling come close to the theme of this seminar, which is "Sport for young school leavers". Results concerning the relationship between school success and physical activity at different age levels are not very easy to interpret. It can, however, be noticed fairly consistently that particularly among 14 and 18 year-olds school success is related to physical activity. At the ages of both 14 and 16 pupils with a very good school performance are more active physically than others, and at the period in life when interest in physical activity decreases in general the participation of the least successful pupils shows the most drastic decline.

At the age of 18 physical activity is the most common among pupils of average or slightly above-average school success, while pupils with very high school performance show less active in physical exercise and the least active is shown by the least successful pupils. The results concerning the relationship between academic success and participation in physical activity are much the same among boys and girls.

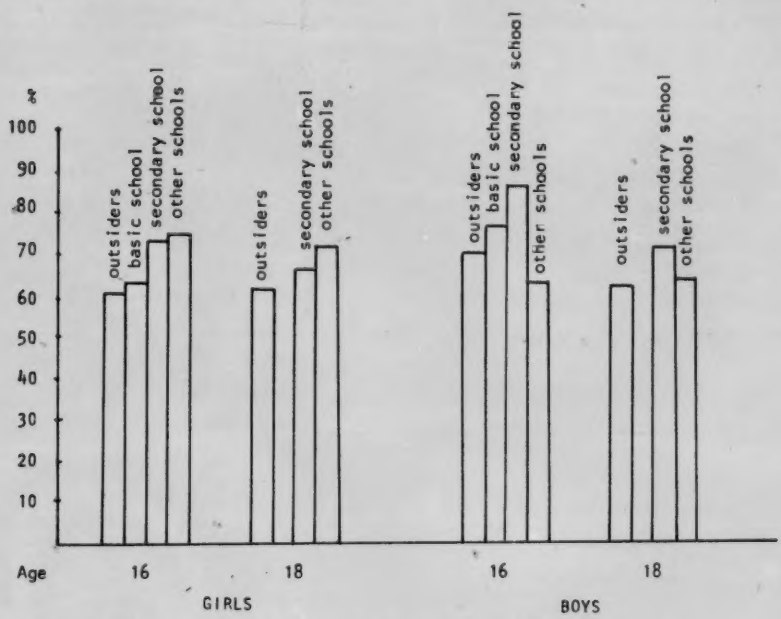

FIGURE 3. Sport participation in different school forms.

The problems connected with the ending of school are illustrated even better by a comparison of physical activity among pupils in different types of schools. Since the basic school is uniform up to the age of 16, it is not possible to make such a comparison among pupils younger than 16. The group of girls who are in schools other than the basic school and the senior secondary school has shown the greatest participation in physical activity, although participation among senior secondary school girls is almost equally high. Participation is lower among girls who are still in the basic school at the age of 16 and the lowest among girls who have left school. In the boys' group the differences are similar with the exception that boys who are in schools other than the basic and senior secondary schools are not the most active in physical exercise but in fact compete for the bottom placement with those who have left school.

Accordingly it appears that young people who left school are less active in leisure time sport than those who are still at school, although it is not possible to draw any conclusions about at what stage the differences arise.

A preliminary picture of the significance of the final stage of formal schooling is provided by an analysis carried out on the data collected in the project dealing with the health habits of youth. The measurements were made, one in the winter and the other in the autumn of 1977 (Rimpelä & al 1978). In the time between the two measurements some of the youth had left school and they were compared with those who had stayed at school and with those who had been out of school even in the previous winter. The results indicated rather consistently that participation in physical activity was best preserved from winter to autumn among those who had stayed at school. The results were similar both among boys and girls. Even if we take into account the fact that participation in physical activity varies also by the time of the year, it would seem that there is less change in the participation of the school youth than among other youth including those who have left school.

TABLE 1. Sport activities during winter 1977 and autumn 1977 (Rimpelä & al. 1978).

BOYS

Sport participation in winter 1977 once/week or less often

Sport participation in autumn 1977	School boys (N=98) %	Boys outside the school (N=63) %	School leavers (N=43) %
Once/week or less often	67	75	70
At least twice/week	33	25	30
	100	100	100

x^2=1.11 n.s.

Sport participation in winter 1977 at least twice/week

	School-boys (N=210) %	Boys outside the school (N=51) %	School leavers (N=37) %
Once/week or less often	20	30	34
At least twice/week	80	70	66
	100	100	100

x^2=7.96 $p < .05$

On the other hand, on the basis of the results obtained it is not possible to conclude what is the effect of P.E. in schools on this outcome and to what extent it is explained e.g. by the unchanged pattern of life among school youth compared with those young people who enter the world of work, or much worse, have to join the unemployment files. It should also be stressed that the decrease of participation in physical activity towards the end of formal schooling is quite small compared with the general decrease that takes place in youth along with physical, psychic and social development.

TABLE 2. Sport activities during winter 1977 and autumn 1977 (Rimpelä & al. 1978)

GIRLS

Sport participation in winter 1977 once/week or less often

Sport participation in autumn 1977	School girls (N=145) %	Girls outside the school (N=74) %	School leavers (N=61) %
Once/week or less often	71	82	71
At least twice/week	29	18	29
	100	100	100

x^2=3.87 n.s.

Sport participation in winter 1977 at least twice/week

	School girls (N=175) %	Girls outside the school (N=50) %	School leavers (N=53) %
Once/week or less often	28	34	34
At least twice/week	72	66	66
	100	100	100

x^2=1.17 n.s.

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Lauri Laakso

SOCIAL MOBILITY OF FINNISH ELITE-ATHLETES OF DIFFERENT ACHIEVEMENT LEVEL

9th World Congress of Sociology, Uppsala, Sweden, 14-20.8.1978

1. INTRODUCTION

The importance of top athletics has increased in present-day society and along with this development the position of the people involved in it, top athletes, has become more and more visible. From the point of view of the individual athlete, this means that if he is successful he will have a good chance of obtaining a socially significant position through sport - but on the other hand with the upgrading demands of performance he is compelled to make more and more personal sacrifices in order to reach the top and stay there.

This conflict situation has been the starting point in several sport sociological investigations, which have attempted to explore athletes' social position and social mobility (e.g. Krawzyck 1973, Loy 1972, Lüschen 1963, Mäkelä 1974, Redl 1974, Ulrich 1976, Zingg 1971). The results have shown that there is a considerable variation in the athletes' social background by the sport-discipline (e.g. Loy 1972, Lüschen 1963, Mäkelä 1974, Ulrich 1976). Also the results concerning the relations between athletic success and social mobility have been contradictory and varied by different sports (Loy 1972, Lüschen 1963, Redl 1974, Zingg 1971).

On the other hand, sport sociological studies have also attempted to examine the sacrifices athletes are compelled to make for their career (e.g. Hammerich 1972) and they have shown that sport has had negative effects, for example, on school work and studies (e.g. Vuolle 1977).

The starting point of the present study, which has been made as a little part of the cross-national Project on Leisure Role Socialization (Kenyon & McPherson 1970), has been the observation made about Finnish top athletes according to which the social background of athletes belonging to the international elite was lower than that of athletes at the national top level (Laakso 1977). The result was interpreted so that athletes from the lower social groups seek to use sport as a means of upward mobility. The purpose of this report has been to find out whether athletic success is related to social mobility when top athletes of different performance level are compared with each other. Social mobility has been assessed only by comparing the athlete's occupation with that of his father. Thus the results do not tell much about changes in social position in larger sense nor do they describe the athlete's social mobility in the light of changes in his own occupation.

2. METHODS

The research data were gathered as the Finnish contribution to the Project on Leisure Role Socialization (Kenyon & McPherson 1970), which strives to compare sport involvement in a number of countries.

A questionnaire was sent in autumn 1975 to 117 track and field athletes of the Finnish national team and to 108 Division I Finnish baseball-players. The questionnaires were returned by 97 athletes (83%) and by 95 baseball-players (88%). These sport disciplines were selected to serve the purposes of the international study so that track and field athletes represented an internationally widely spread sport and Finnish baseball was representative of a typically national sport culture.

For the purposes of this study, track and field athletes were divided into two groups: international elite (N=41) who had represented Finland in the European Championship or the Olympic Games and other members of the Finnish national team (N=56). Baseball-players were also divided into two groups: players (N=36) the criterion being the fact that

In the baseball players group the distributions of fathers' occupations appeared fairly similar in the two groups (Table 1). But also here the top-players were significantly less educated than the other players (Table 2). When the social background of the top athletes was lower than that of the rest, it could be expected that for them sport would have functioned as the channel of upward mobility. In order to stody this assumption, the athletes' occupations were compared with those of their fathers.

When this kind of social mobility was examined, it was found that the upward social mobility had been most common in groups where downward social mobility from farmers and working class to clerical and managerial occupations or to a student position had occurred in 69% of Division I baseball players, in 54% of top baseball players, in 52% of the national track and field team and in 41% of those belonging to the international track and field elite.

On the other hand, athletes with clerical or managerial backgrounds were mainly also themselves in clerical or managerial positions or were students (Table 3). However, 23% of them had moved to the working class. This social mobility from the clerical and managerial class to the working class was the most common among the international elite (33%) and the next common among the track and field athletes (30%). Among top baseball players a similar shift had occurred in 18% of all such players, while such mobility was the least common among other Division I baseball players (15%).

There is reason to assume that changes in social position are at least partly due to persons' educational background. As mentioned earlier, differences in educational background were in agreement with social mobility (Table 2). For this reason, the social mobility was analyzed so that educational level was held constant (Table 4). The number of cases was, however, so low that meaningful interpretations could only be made as regards upward social mobility. Educational level did, in fact, explain the greatest part of social rise. Most of the athletes coming from the working class or from the farming population who had received at least a lower secondary education had moved to the clerical or managerial group. Only 28% of them remained in the working class, which is explained by the fact that this group of "educated" athletes also in-

they had been selected at least once to play in the prestigious East-Finland vs. West-Finland contest played at the end of each season, and other Division I players (N=59).

3. RESULTS

As mentioned earlier, the starting point of this analysis was the observation according to which in the male track and field groups those belonging to the international elite more often than the rest came from working-class families (Table 1). The difference was not significant but when we take into account the differences in educational background (Table 2) which were in agreement with social background (the international track and field athletes were significantly less educated than other athletes), we can say that the international elite had lower social starting level than other track and field athletes.

TABLE 1. Occupation of father of Finnish elite athletes

	Track and field athletes (male)		Baseball-players	
	International elite (N=32) %	Others (N=40) %	East-West players (N=36) %	Other I Div. players (N=59) %
Clerical or managerial	26	30	31	30
Labourer	48	35	44	41
Farmer	26	35	25	29
	100	100	100	100
	x^2=2.1570 ns.		x^2=0.2905 ns.	

TABLE 2. Education of Finnish elite athletes

	Track and field athletes (male)		Baseball-players	
	International elite (N=32) %	Others (N=40) %	East-West players (N=36) %	Other I Div. players (N=59) %
Primary level	78	38	56	27
Lower secondary level	6	24	22	27
Upper secondary or tertiary level	16	38	22	46
	100	100	100	100
	x^2=11.2675 p<.01		x^2=7.4451 p<.05	

cluded those who had obtained only a lower secondary education.

TABLE 3. Social mobility of Finnish elite athletes

Track and field athletes

Own occupation	International elite Father's occupation: Working class or farmer (N=22) %	International elite Father's occupation: Clerical or managerial (N=6) %	Others Father's occupation: Working class or farmer (N=23) %	Others Father's occupation: Clerical or managerial (N=10) %
Labourer or farmer	59	33	48	30
Clerical, managerial or student	41	67	52	70
	100	100	100	100

Baseball players

Own occupation	East-West players Father's occupation: Working class or farmer (N=24) %	East-West players Father's occupation: Clerical or managerial (N=11) %	Others Father's occupation: Working class or farmer (N=35) %	Others Father's occupation: Clerical or managerial (N=13) %
Labourer or farmer	46	18	31	15
Clerical, managerial or student	54	82	69	85
	100	100	100	100

The most interesting group from the point of view of the upward social mobility of athletes was, however, that to which those athletes belong who come from the working class or farmin background and have only gone through the compulsory primary school. Thirty per cent of them had moved to the clerical and managerial class (Table 4). However, differences between different athlete groups were great. Mobility had been most frequent among the other Division I baseball players (62%) and nex frequent among the track and field athletes belonging to the national team (29%). On the other hand, social rise without adequate educational foundation was infrequent among the athletes belonging to the elite athletes or top-players. Seventeen per cent of the international elite athletes and no East-vs.-West baseball player having only compulsory primary education had moved to theclerical or managerial class.

TABLE 4. Social mobility of Finnish elite athletes when educational level is controlled (father's occupation labourer or farmer)

Track and field athletes

Own occupation	International elite Education of athlete: Primary level (N=12) %	International elite Education of athlete: At least secondary (N=6) %	Others Education of athlete: Primary level (N=14) %	Others Education of athlete: At least secondary (N=8) %
Labourer or farmer	83	17	71	25
Clerical or managerial	17	83	29	75
	100	100	100	100

Baseball players

Own occupation	East-West players Education of athlete: Primary level (N=6) %	East-West players Education of athlete: At least secondary (N=16) %	Other I Div. players Education of athlete: Primary level (N=13) %	Other I Div. players Education of athlete: At least secondary (N=17) %
Labourer or farmer	100	31	38	29
Clerical or managerial	0	69	62	71
	100	100	100	100

In the end of this study the connection between social mobility and objectives the athletes had set for themselves were analyzed (Table 5). In this sense, it was an interesting observation that socially risen athletes differed clearly from those who had experienced no social mobility when they were asked, "How important was each of the following when participating in sport at the age of 13: to participate to the best of your ability; to defeat your opponent; to participate fairly".

TABLE 5. Social mobility and athlete's objectives in sport participation

How important was each of the following when participating in sport at the age of 13	No social mobility (N=77) %	Upward social mobility (N=58) %	Upward social mobility without education (N=13) %
To participate to the best of your ability	43	40	25
To defeat your opponent	31	47	67
To participate fairly	26	13	8
	100	100	100

Forty-seven per cent of those athletes who had experienced upward social mobility had considered defeating the opponent as the most important objective whereas the same objective was considered the most important by 31% of those who had experienced no social mobility. Among the no-mobility group 26% considered fair play the primary objective while the amount of like-minded socially mobile athletes was only 13%. The differences became still clearer when the objectives of those athletes who had risen socially without education where studied. Among them as many as 67% sought mainly to defeat the opponent and only 8% valued fair play highly.

4. DISCUSSION

The purpose of the study was to explore the relationship between athletic success and social mobility among top athletes. The possibility of drawing reliable conclusions is restricted by the small number of athletes included in the study and the fact that athletes represented only two sport disciplines: track and field (N=97) and Finnish baseball (N=95). Still, the results proved rather consistent so that national level athletes and players were better placed vocationally than international elite athletes and top-players. This, perhaps somewhat surprising finding, was manifested so that athletes and players who had made it to the highest elite had moved upwards socially less frequently than had done athletes belonging to the national level, when the athletes' occupation was compared with his father's occupation. On the other hand, downward social mobility had been more common among the international elite than among the other groups. Furthermore, upward social mobility was more common among baseball players than among track and field athletes.

Education explained a considerable part of the athletes' upward social mobility, but there had also been social rise independently of education, and it was also more frequent among the national level athletes than among the highest level elite athletes. Thus it seemed obvious that athletes and players belonging to the highest elite had been obliged to make educational and occupational sacrifices for their athletic careers rather than benefited vocationally by sport. This held true at least in comparison to those athletes and players who had not made it to the absolute top in their sport or game. When, however, among the international

elite both social background, measured by father's occupation, and educational level were lower than among other athletes, it is possible that there exis motivational factors associated with social position which are important for becoming a top athlete.

The obtained results may, for instance, indicate that athletes at the very top level are so sport-oriented that their motivation is limited to seeking excellence only in sport. On the other hand, it may also be assumed that reaching the top even in amateur sport may bring many financial benefits[1)], which means that change of occupation becomes, in a way, unnecessary. It showed also be specially pointed out that the subjects of the present investigation were still actively competing athletes and it is likely that change of occupation takes place, if at all, towards the end or after the active athletic career. In some studies it has accordingly been found out that athletes change occupation only after their best achievements (cf. Redl 1974). This seems reasonable on the one hand, because athletic success can then guarantee better possibilities for occupational rise and, on the other hand, because during the one's active career the athlete may be able to take better advantage of an occupation which offers sufficient training opportunities than of one which is socially highly esteemed or financially rewarding. On the basis of the data of the present study, it is not, however, possible to study changes in athletes' own occupations.

Further, if the problem is studied from the point of view of upward social mobility it appears obvious that reaching the national top-level is enough, if the goal is social rise through sport. Thus the effort to reach the international top-level presupposes different motives. The question is, at least in part, which kind of objectives the athlete has set for himself and what the motives behind these objectives are. Therefore it was very interesting that socially risen athletes and players, especially, those who had risen without education, considered also in sport defeating the opponent more important and fair-play less important than the no-mobility athletes and players.

The results do not give a definite answer to the question about the sport motives of athletes at the national and international levels, respectively. The goal ratings described earlier do show, however, that differences in athletes' social mobility are not haphazard but are, at least in part,

based on fairly early acquired views on the meaning of sport. It showed, however, be stressed that these views may be significant from the point of view of athletes' achievement motivation insofar as making an effort to reach the highest level in athletics would seem require a more stable foundation than is provided by the acquisition of material benefits through sport.

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OLYMPIC SUCCESS: THE INFLUENCE OF NON-MATERIAL AND MATERIAL FACTORS

(previously published in International Review of Sport Sociology, Warszawa, Poland 13(1978)2, 5-22.

1. INTRODUCTION

Early social scientific study of the Olympic Games was directed either towards the history of the Games or towards ideological critiques of Olympic ideals. Recently, a new dimension has been added to Olympic studies, namely an attempt to discover the socio-economic factors associated with Olympic success. Concern with explanations of Olympic success has resulted from the explosive growth of sport in recent decades throughout the world, including the developing countries.

The cultural character of modern sport has permitted qualitative comparative analysis between nations (see, e.g. Allardt 1970). In addition, modern sport, with its common forms and rules provided a framework for quantitative comparative analysis between nations.

As sport has developed, so have records and statistics, which are an essential part of the sport institution. At the same time, an increasingly sophisticated information technology has been generating more exact international and intranational standard of living indexes. The combination of growth in sport plus advances in standard of living statistics has actually forced attention to the topic of Olympic success in terms of socio-economic factors (see e.g. Ball 1975).

There is no doubt that a number of nations occupy high positions in rankings of both Olympic victories and standard of living. However, the connection between these two variables is not so simple. Thus, a number of researchers have shown an interest in studying the reasons for the repeated success of some nations in Olympic competition. The present study also focuses on this basic question. Our goal is not to repeat all that has been previously reported on this topic. Rather we attempt to connect the findings of previous studies to a common frame of reference by comparing differing explanations of the same data.

2. PROBLEM

In previous studies, which have all been comparative in nature, researchers have tried to isolate general features common to nations that have met with Olympic success. Using different research strategies and frames of reference it has been determined: 1) that individuals and teams of other certain nations have more frequent and regular Olympic success than those of other countries, and 2) that these differences can be explained by certain material and non-material living conditions. Among the explanatory variables that have been used are economic factors such as national income (absolute and per capita); cultural and social resources including level of education, health care and nutrition; and demographic factors such as population, population density and the level of urbanization (see e.g. Ball 1972; Jokl & al. 1956, Novikov & Maximenko 1972 and Levine 1974). To summarize the basic results of these studies, it can be stated that the greater the economic, social and population resources of a country, the greater the Olympic success that country has experienced.

The influence of non-material (social and cultural) factors upon Olympic success has been emphasized by Novikov & Maximenko (1972) & Levine (1974). Among the cultural variables, religion has been singled out as an explanatory factor by LÜschen (1967) and Seppänen (1970). According to these studies, the effect of non-material cultural differences is shown by the fact that nations which are predominently Protestant are more succesful at the Olympic Games, and in sport, generally. LÜschen's analysis, on the individual level, of the religious background of Olympic winners supports this hypothesis. However, the issue is more

questionable in Seppänen's paper. Seppänen categorizes nations according to Weber's (1963) classes of religious culture. These range from the class of innerworldly mysticism (Confucianism, Islam) to the class of innerworldly asceticism (Orthodox, Protestant). However, Seppänen then suggests that it is not Protestantism which is the highest point of innerworldly asceticism, as Weber thoughts, but rather the political economy of socialism.

Seppänen is convinced that the secular superstructure in socialist societies is still more innerworldy than in Protestantism, although he recognizes that the former lacks a belief in the supernatural, and with the belief, a road to salvation by asceticism. Seppänen's classification is based on a mixture of religious and economic elements and this surely affects his results and their interpretation. Combining socialism and religious tradition in this way makes the independent variable problematical. It conflicts with the facts about religious tradition in most socialist countries. Poland, for instance, is classified as a socialist nation and not a Catholic country despite the fact that 80-90 % of the population belongs to the Catholic church. Had socialist states been able to eradicate religious traditions and beliefs rapidly and effectively, there would be reason to question the importance of religion as an explanatory variable. But despite its hostility towards religion, socialism, which is a few decades old, has not been able to destroy old religious traditions. Therefore it is very important to separate religious culture and economic systems as explanatory variables.

Most previous studies of Olympic success have two other problems which have usually been overlooked. The first is that the correlations between the independent variables have typically been quite high. This may mean that Olympic success is due fundamentally to the presence of a single factor (economic development, for example) which in turn is hihgly correlated with the other explanatory variables selected for study. The second problem is that a number of studies have failed to clarify adequately the criteria for measuring the dependent variable, Olympic success. Some studies have dealt only with absolute success (Ball 1972, Novikov & Maximenko 1972); or solely with relative success,

that is victories in proportion to population (Seppänen 1970). In only one study (Jokl & al. 1956) have both criteria of success been examined together. The aim of the present study is to overcome these problems by analyzing the effects of selected material and non-material factors, separately and jointly, upon Olympic success as measured in both absolute and relative terms.

3. DATA

The data reported here come from the 1964 summer Olympic Games held in Tokyo[1]. The data are from 54 of the 94 nations which participated in the Tokyo games. The nations in the sample were those whose athletes were among the top 8 finishers in individual and team events for both men and women[2]. Because this study deals with results and hypotheses which have been reported previously in the literature, it is not necessary to repeat here descriptive details of the 1964 Games.

Several questions can be raised about the data base. One pertains to the use of information collected from only one Olympic year. Previous studies suggest that this is not a problem, because they have demonstrated a consistency in the research results obtained by a variety of research methods on a number of different Olympic Games (see e.g. Ball 1972, Novikov & Maximenko 1972, Levine 1974, Grimes & al. 1974).

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1) The data were collected, and much of the analysis performed in 1968 during the post graduate training period of the senior author.

2) The following countries were included in the sample: Afganistan, Argentina, Australia, Bahamas, Belgium, Bermuda, Brazil, Bulgaria, Chile, Cuba, Spain, Ghana, Ethiopia, Philippines, Formosa, Guyana, Netherlands, India, Iran, Ireland, Great Britain, Italy, Austria, Jamaica, Japan, Yugoslavia, Canada, Kenya, Greece, Mexico, Soviet Union, Norway, Ivory Coast, Niger, Pakistan, Peru, Portugal, Poland, France, Romania, Sweden, Finland, Switzerland, Denmark, Czechoslovakia, Turkey, Hungary, Uruguay, New Zealand, Venezuela, USA (United States of America), United Arab Republic, Trinidad, Tunisia.

The Federal Republic of Germany and the German Democratic Republic and the Republic of Korea and the Korean People's Democratic Republic were all eliminated from the sample, because both sets of countries fielded a single team in 1964.

The second question concerns the use of data from only the top scoring nations in the Games (see Ball 1972). This selection strategy has both advantages and disadvantages. The 54 nations in the sample, generally speaking, are those whose sport efforts are focused on Olympic or international success. The other countries are "developing nations" in terms of sport. While they may have rich national traditions in physical culture, by and large, they do not mount major campaigns to prepare for the Olympics. To include such nations in the sample would have made the analysis and interpretations substantially more complicated. The lack of adequate statistical information from the non-successful nations would have added further difficulties. The sample could have created a problem had the 54 nations been homogeneous in terms of important economic and cultural factors and sport possibilities. However, it turns out that there is sample variation among these nations in the preconditions and possibilities for sport, as well as in the results of Olympic competition. Nevertheless, it should be kept in mind that the interpretations are valid only for the more succesful Olympic nations.

Another question deals with the unit of analysis of this study, which is the nation. Is this in conflict with the Olympic ideal which calls for competition between individuals and not nations? Despite the IOC ideal, it has been the unofficial but nearly universal practice to keep score between nations. From a research point of view, most articles on Olympic success have analyzed success in terms of differences between nations. The nation as a unit of analysis is also justified if one believes that peaceful sport competition between nations can have beneficial international consequences.

4. DEPENDENT VARIABLES

Studies of Olympic success have utilized a variety of indicators to measure success. For example, in North America points are often counted by the principle 10-5-4-3-2-1. This gives much greater weight to a first place finish than does the typical European Scoring principle of 7-5-4-3-2-1 (see Ball 1972). In some cases the indicator of success has been medals won, counting either the total number of medals won (Levine 1974) or summing the values of the medals (gold=3 pts, silver=2 pts, bronze=1 pt) (e.g. Ball 1972). There is no doubt that all of the above mentioned

measures of success are so highly correlated with each other that the choice of indicators should not influence the research outcome (see e.g. Dizz 1968 in Novikov & Maximenko 1972). The measurement of the dependent variable in this study is based on two principles: 1) winning (coming in first) should not be overemphasized and 2) the number of scores should be enlarged as much as possible. As a result, points were assigned to the eight best in every event (in many events the finals consist of eight athletes, instead of six, as before). Eight points were given to the first place finisher, seven points for second place, and so on[1].

More problematical is the question of whether to use absolute or relative measures of Olympic success. (We have already indicated we will use both in this study.) Absolute, or raw scores, do not take into account size and population differences between countries. So, given two nations which have similar standards of living and levels of development, the one larger in population and size would have better opportunities to find top athletes as well as to train them for a larger variety of events. The argument in favour of absolute scores is based on the fact that modern top level competitive sport (of which the Olympics is an example) is absolute by nature. What counts are victories and points scored[2].

However, one cannot ignore the point that a large and populous country which scored more Olympic points may have done less well relative to its smaller neighbor[3]. Therefore, the use of relative scores might

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1) In some events we had to be satisfied with the best six (wrestling, hockey, fencing, gymnastics) or the top four (cycling, boxing, judo, football), because the official results of the Tokyo Games list only those numbers.

2) The slogan "Victory is not the most important thing; it is the only thing!", credited to the American football coach Vince Lombardi, sums up this point of view.

3) In Seppänen's (1970) view: "The unweighted scores are unsatisfactory indices of sport success of a nation as it would be, if per capita terms were not taken into consideration in comparisons of the standard of living between different countries. In so much as the standard of living is not higher in India than in Norway, although the gross national product of India is greater, in so much the nations scoring more than some others need not necessarily be better in sport."

have some advantages, but, this method can also be criticized. Relative scoring is biased against the larger countries because official limitations on the number of participants prevent larger countries from sending teams which are truly in proportion to their size[1]. Absolute score have been used in most previous studies, due to the fact that researchers have come mainly from the more populous countries. On the other hand, Seppänen, and a majority of Jokl's group were from Finland, a small country which has done well in Olympic competition, in a relative sense. This explains the willingness to use relative scores in this study.

The correlation between the rankings of countries on absolute and relative scores is -.01, which shows that the two methods are independent of each other and measure success in different ways. This is shown in Table 1 which lists the 10 best countries in the 1964 games.

TABLE 1. List of countries Ranking Highest in Absolute and Relative Success in the 1964 Olympic Games*).

ABSOLUTE SUCCESS RANKING	RELATIVE SUCCESS RANKING
Soviet Union	Bermuda
United States	Bahamas
Japan	Trinidad
Italy	Hungary
Hungary	New Zealand
Great Britain	Australia
Australia	Sweden
Poland	Finland, Bulgaria, Denmark
France	
Romania	

*) Germany would have ranked third in absolute success had it been included in the sample.

In absolute terms, the most successful nations in Tokyo, as they had been from 1952 on, were the USSR and the USA, both large nations in terms of population and resources. Relatively speaking, however, these countries did not fare as well. The US ranked 20th and the Soviet Union was even

1) Years ago when U.S. male athletes dominated a number of events in track and field, they used to joke that it was more difficult to make the U.S. Olympic team than it was to win Olympic medals.

lower, in 22nd position. The best teams in the relative ranking were tiny Carribean Island nations which only needed one Olympic scorer to earn their top positions. Small Northern European countries with strong Olympic traditions, small socialist states, as well as New Zealand and Australia also did well in relation to population size.

The decision to use both absolute and relative scores is determined by the theoretical aims of this study. The relative scores are theoretically more comparable than absolute scores because they retain cross-national commensurability with regard to one resource factor. Absolute scores easily reflect only differences in size, population and other resources of nations.

Some researchers have examined relative and absolute Olympic effectiveness using variables other than point scores. Thus, some studies have taken account of the severity of selection criteria of Olympic teams by relating scores to the size of the team.

What is surprising is the absence of attempts to measure success of different subgroups in the games, as for example, individual vs. team events, mens' vs. womens' events, strength vs. other events, and so on. It may be that overall relative success is correlated so highly with relative success of the above subgroups that the latter do not add any explanatory power to the analysis. For example in the 1964 Games the relative success of the above mentioned subgroups had correlations of between .66 and .99 with total relative success (these correlations were calculated for a sample of 30 nations).

5. INDEPENDENT VARIABLES

Material and non-material factors are the two independent variables in this study. Material explanatory factors relate to demographic, social and economic resources, while economic systems and religious culture

constitute the non-material elements[1]. It was clear that most of the material factors represented slightly different ways of measuring the same aspects of development or resources. The decision was therefore made to eliminate a number of the material elements from further consideration in the analysis. Principle component analysis and varimax rotation was used for this purpose. Any variable which had at least a .75 correlation with another variable was removed from the study. Percentage of agricultural population correlated -.77 with per capita national income and was therefore eliminated; as was amount of television receivers, which correlated .83 with national income. Nine variables remained in the final principal component analysis, grouped into the following four components (Principal components and the components of varimax rotation are presented in Table 5, in section of Results.).

1. Economic development (National income/capita)
2. Population density (inhabitants/km^2)
3. Amount of population (population)
4. Level of health care (inhabitants/physicians)

These variables (in parentheses) were used in the final analysis[2] together with the non-material factors of economic systems (capitalism vs. socialism) and religious culture.

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1) Variables and references: Populations, population density (inhabitants/km, calories/person/day, infant mortality/1000 health born, inhabitants/physician, TV-receivers/1000 inhabitants, cars/1000 inhabitants) (Statistical Yearbook 1966, United Nations 1967); Students/1000 inhabitants, (Statistical Yearbook 1966, Unesco, Louvain 1968); Level of urbanization (Breese 1966); Percentage of agricultural population (Production Yearbook Vol. 20, 1966, FAO, Roma 1967); Percentage of 15-30 years old (Demographic Yearbook 1966, United Nations 1967); Regional culture (Weber 1963, and introduction written by Parsons); National income/capita (Yearbook of National Account Statistics 1966, United Nations 1967)

2) The second component had two equally strong variables. The one chosen for final analysis, inhabitants /physician, described health care better.

6. RESULTS

As expected, the results show the relationships between the variables in both absolute and relative success to be in the same direction as in former studies. However, relative and absolute success correlate in quite a different way with the explanatory variables. The results also reveal that non-material factors explain less of the variance about the dependent variables than do the material factors. On the non-material variables, type of economic system seems to be related to absolute success and religion to relative success. Such findings were also obtained by Novikov & Maximenko (1972) and Seppänen (1970), but never before have these factors been analyzed together in a single study. The results also suggest that relative and absolute success are explained by different factors, which is understandable given the fact that different countries are at the top of the absolute and relative success rankings.

According to the selection system, the material variables are inter-correlated. Of these, per capita national income and population are related to absolute success, while only population density would seem to explain relative success.

TABLE 2. The correlation of material and non-material factors to relative and absolute scores.

Explanatory variables	Relative success Scores/inh. r	Absolute success Scores/country r
Non-material factors:		
Economic system (→ socialist economy)	.00	.29
Religion (→ innerwordly ascetism)	-.22	-.10
Material factors:		
Economic development National income/capita (→ large)	.18	.47
Inhabitants/km^2 Population density (→ large)	.61	-.03
Health care Inhabitants/physician (→ little)	-.14	-.15
Population (→ large)	-.17	.44

It may be noted in passing that the non-material factor of economic system correlates weakly with all the material variables, while religion has a substantial correlation only with per capita national income (-.53) and a weaker one with population (.26).

Table 3 shows the influence of material factors on Olympic success, when the non-material variables have been controlled for.

TABLE 3. Partial correlations of material variables to Olympic success, when non-material variables have been controlled.

Explanatory variables	Relative Success Scores/inh. Partial r	(r)	Absolute Success Scores/country Partial r	(r)
Economic development National income/capita (→ large)	.08	(.18)	.55	(.47)
Inhabitants/km^2 Population density (→ large)	.66	(.61)	.00	(-.0)
Health care Inhabitants/physician (→ little)	-.13	(-.14)	-.12	(-.1)
Population (→ large)	-.12	(-.17)	.51	(.44)

The non-material factors do not seem to add much to the explanation provided by the material variables. Per capita national income and population receive a bit more emphasis as explanatory variables of absolute success; the same is true of population density as an explanation of relative success.

When material factors are controlled for, the results in Table 4 reveal the influence of non-material elements.

TABLE 4. Partial correlations of non-material variables to Olympic success, when material variables have been controlled.

Explanatory variables	Relative Success Scores/inh. Partial r	(r)	Absolute Success Scores/country Partial r	(r)
Economic system (socialist economy)	.08	(.00)	.45	(.29)
Religion (innerwordly ascetism)	-.25	(-.22)	.05	(-.10)

The control of material variables enhances the importance of the economic system to absolute Olympic success, in the direction of favouring the socialist countries. Religion, on the other hand, remains weak as a factor in absolute success, while the negative correlation between innerwordly ascetism and relative success rises very slightly.

TABLE 5. The principal components and varimax rotated components of explanatory variables.

	Principal components				Varimax rotated components				
1. Degree of urbanization	.77	-.07	-.13	.06	.72	.20	-.19	.17	.62
2. Inhabitants/km^2	.14	.20	-.21	.92	-.01	.11	.01	.97	.94
3. Infant mortality	-.18	.70	.40	-.19	-.36	.61	.42	-.22	.72
4. Cal/person/day	.71	-.18	-.03	-.22	.73	.12	-.16	-.14	.59
5. National income/capita	.84	-.35	.11	-.00	.92	-.03	-.00	.03	.85
6. Students/1000 inh.	.75	-.19	.40	.05	.81	.08	.30	.03	.76
7. Inhabitants/physician	-.66	-.61	-.05	.07	-.40	-.81	-.02	-.06	.81
8. 15-30 year-olds	.43	.76	-.23	-.04	.10	.87	-.20	.13	.82
9. Population	-.10	.00	.91	.26	.01	-.09	.94	.04	.90
Eigenvalue	3.06	1.68	1.25	1.01	% of total value				
					31.67	20.47	13.99	11.68	
Cum % of total variance	33.97	52.69	66.61	77.80	% of common variance				
					40.70	26.31	17.98	15.02	

Thus economic system contributes to an explanation of absolute but not relative success, while religious culture helps explain (very weakly, to be sure) relative but not absolute success. The minor explanatory power of religion can be viewed as a surprising outcome compared to its importance in previous studies.

A stepwise regression analysis was performed to show that combinations of variables best explain Olympic success, and how much variance these combinations explain. Non-material factors explained 5 % of the variance of relative success (R=.22) and 10 % of the variance of absolute success (R=.31). Correspondingly, material factors explained 44 % of the variance of relative success (R=.66) and 41 % of absolute success (R=.64).

The best two variable model which explained relative success was population density (β=.65) x religion (β=.28) which explained 46 % of the variance. A three variable model was needed to explain absolute success with the same explanatory power as all variables together. This model consisted of economic development (β=.50) x population (β=.44) x economic system (β=.34), which explained 52 % of the variance.

7. SUMMARY AND DISCUSSION

Absolute and relative rankings of Olympic success are uncorrelated to each other and measure success in quite different ways. The variables used in this study explain absolute success better than relative success. Furthermore, each type of success is better explained by different independent variables. The connection between economic resources, socialist economy and absolute success has been shown more or less clearly in previous studies (Novikov & Maximenko 1972, Levine 1974). The superior sport performance of Protestants compared to others has also been demonstrated previously (Lüschen 1967, Seppänen 1970). Population density is surprising as a variable which is related to relative success. Also surprising is the lack of a connection in the present data between economic and population resources and relative success. One possible explanation for the latter finding is that absolute success is primarily a measure of resources. To be near the top in absolute scoring a nation has to take part and be successful, not in one or two events, but in many of them. This requires vast sport resources. On the other hand, a smaller country with fewer resources may succeed, relatively by entering athletes in only a few events in which the available sport resources can be used effectively, based on the nations' sport cultural traditions, its' natural resources, etc. Relative success does not measure the amount of sport resources which a nation applies to the Olympic task, but rather the effectiveness with which available resources can be directed to achieve a nation's Olympic goals.

Economic development and population are understandable factors in absolute Olympic success because of their implications for sport training. If sporting talent is distributed evenly among populations, those nations which are population-rich have naturally better possibilities (Grimes

& al. 1974), especially if they have the economic resources to exploit the advantage which a large population provides.

The meaning of a socialist economy as an explanatory factor is less clear, from both theoretical and practical standpoints. It has often been stated that the conflict between socialist and capitalist states led the former to effective organization and political utilization of modern sport (see e.g. Morton 1963). But without more precise specification, such claims are propagandist by nature. They do not explain the concrete reasons which account for the success of socialist states. One possible reason might be found in the organization of physical culture. It might also be the case that planning and centralization, which are typical in socialist states, produce results which cannot easily be matched in capitalist countries where the voluntary organizations which oversee sport are resistant to state planning and control.

Among the material factors, population density stands out as an important element accounting for relative success. Nations with high population densities succeed in Olympic competition (-.17) with relative success. This suggests that the preconditions for modern sport may exist to a greater degree in small population but high population density countries than in other types of nations. There is no doubt that Olympic sport is urban or industrial by nature, in that it presupposes facilities which can be built only in an urban milieu. At the same time, it also requires a cultural atmosphere in which achievement motivation is stressed, and where the society is willing to pay the price for winning. In addition, the small nation which is densely populated may be in an advantageous position with regard to the effective organization of sport.

The weak explanatory power of religion is the most problematic result. The weak relationship between religion and absolute success might be explained by referring to the inherent close connection between absolute success and resources whereby the effect of the ideational structure of the culture is limited and can be compensated for by mobilizing resources to a given extent.

In contrast the relative success is essentially connected with urbanization and high population density whereby cultural traditions may play a significant role in the selective allocation of resources. If we assume that the aforementioned explanations are correct, we have to stress the weakness of the relationship in the present data. One possible reason for the weak explanatory power of religion might be that its effect is only indirectly connected with sport success through economic and population resources. The controlling of per capita national income drops the zero order correlation between religion and relative success from -.22 to -.14, which give some support to the interpretation. Increasing secularization, which is typical of urban areas, might be another reason for the weak explanatory power of religion.

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Pauli Vuolle

HISTORY OF SPORT FINANCES IN FINLAND AND OTHER SCANDINAVIAN COUNTRIES

7th International Congress of HISPA
Paris, France, 28.3.-2.4.1978

National sport and its continuity is today specially dependent on the economic support of society. Compared with the first decades of organized sport during this century the importance state financial aid has increased remarkably. The change has been caused especially by the decrease of voluntary work. It was earlier quite usual that sport clubs existed without the help of salaried personnel. When money was needed it was collected by entrance fees or contributions. Membership fees were a particularly important factor in sport club finances.

As the history of Finnish sport and especially the success of Finnish athletes in the first Olympic Games show, voluntary work played an important role as early as the 1920's. It seemed, however, evident at that time that sport clubs could not meet the rising economic difficulties without support from the society.

Sport had, of course received financial aid even earlier, but there was no yearly contribution. The Parliament had appropriated funds for "the improvement of free gymnastics and sports interests", 28.000 Fmk in 1912 and 45.000 marks in 1914, but the Cabinet did not approve

the sums as such. In 1917 a contribution of 60.000 marks to the Gymnastic and Athletic Union of Finland[1] and to some other sport organizations was proposed in the Parliament. After the civil war broke out the Parliament did not, however, have time to deal with this proposal.

In 1919 two members of the Parliament introduced a bill to grant 250.000 marks for the promotion of sport and physical education. In the introduction to the bill they emphasized especially the importance of sport in the advancement of national defence capability. To obtain national unity it was considered important to gain similar success in the next Olympics as had been the case in the previous games. It was suggested that majority of the appropriation should go to the Gymnastic and Athletic Union of Finland, 50.000 marks to the Foundation of the Finnish Women's Gymnastics and the remainder to be divided between the Finnish Swimming Federation (15.000 marks) and the Finnish Football Association (10.000 marks).

During Committee deliberations in the Parliament the importance of sport from the point of view of health care and work capacity was emphasized and it was realized that the benefit would be the greater, the more people and age-groups could be attracted into sports. When the appropriation was cut down to 200.000 by the Committee, it made an important change in the principle of dividing appropriations. The Committee proposed that the share of the Gymnastic and Athletic Union

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1) The Gymnastic and Athletic Union of Finland (later the Finnish Central Sports Federetion, SVUL) founded in 1900 was the first central sport organization in our country. When as a result of the civil war the left wing sport clubs were evicted from SVUL, they founded in 1919 their own central organization i.e. the Workers' Sport Federation (TUL). These two central associations are even today our two greatest sport organizations. From a political point of view we could say that SVUL is a center and conservative organization and TUL is openly a left wing organization.

Because of language fends the Swedish-speaking Finns (appr. 10 per cent of the population) founded in 1912 their own organization, Finland's Swedish Central Athletic Federation (CIF). The other organization receiving part of the first state appropriations the Foundationtion of the Finnish Women's Gymnastics (SNL) was founded as early as 1896, the Finnish Swimming Federation in 1906 and the Finnish Football Association (SPL) in 1907.

of Finland should be cut down to 85.000 marks and that 60.000 marks be allocated to the Workers' Sport Federation, which had been founded a few months earlier. The appropriation proposal based on the Parliament initiative aroused strong opposition in the Committee, because the Workers' Sport Federation would thus receive 10.000 marks more than it had applied for. The Committee explained the raise by its earlier decision to help "clubs functioning among people with small means". The allocations of other organizations were changed so that the Foundation of the Finnish Women's Gymnastics was proposed to receive 18.000 marks, Finland's Swedish Central Athletic Federation and the Finnish Swimming Federation both 12.000 marks and the Finnish Football Association 5.000 marks. Furthermore, the Committee proposed that a State Commission for Sport should be set up to supervise the use of the allocations. Two ex officio members of the Commission would be the inspectors of gymnastics and sports from the National Board of Education and other members would be representatives of the various sport organizations.

The Parliament approved the allocation proposed by the Committee in the early part of 1920. The Ministry of Education set up a Commission for Sport for three years according to the proposal. Its duty was to supervise the use of the grant.

The early days of sport finances followed the example of Swedish to a great extent. In 1898 the central sport federation of Sweden (founded in 1897) received 2000 crowns from His Majesty to participate in a gymnastics and sport festival held in Copenhagen. For the preparations of the Paris Olympic Games a couple of years later a sum of 12.000 crowns was granted. The Government considered the Olympic Games to be an excellent opportunity in making known Swedish gymnastics developed by Per Henrik Ling. As early as the beginning of the 1900's attempts were made to find new sources of finance for sports. In 1908 a permit was given to arrange lotteries for the benefit of sports.

An initiative to stabilize financial aid for sports was taken in the 1902 Diet and a proposal for a 10.000 crown contribution to sport organizations was made in the budget. The proposal was not, however, approved and finally after a number of developments the Diet allocated in 1913 100.000 crowns to the promotion of sports. Even then the

contribution was strongly opposed. One of the arguments was that those who participate in sports can do it on their own expense. Furthermore, it was claimed that working is a better and cheaper way of physical exercise than sport. Some forms of sports were also considered brutal, especially so was the case with wrestling and boxing. It was even suggested that boxing should be prohibited.

The Swedish Conservative Party supported the financial aid proposal most strongly. Their leading politician, professor Clason, felt that sport equalizes social differences and unites the Swedish nation. Social democrats had doubts about sport financial aid at first and they accused sports of being too much upper class in nature.

After state financial aid to sport had been stabilized, the appropriations for sport in Finland (Figure 2) as well as in other Scandinavian countries increased gradually. By 1922 the amount of appropriations had tripled. In 1927-32 the contributions remained at 800.000 marks. Later it decreased somewhat for several years, until it rapidly grew in the late 1930's. Thus in 1939 the sum allocated was almost 2 million marks.

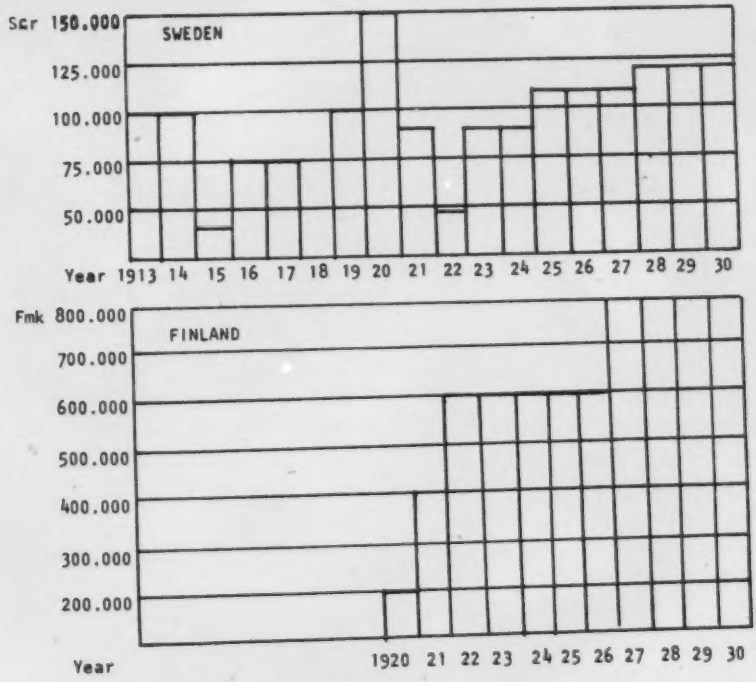
A striking change in state financial aid took place in 1931 when the Parliament on an initiative taken by the State Commission for Sport for the first time approved a 300.000 marks allocation for financial aid in the building of athletic fields. The amount of this allocation varied from 300.000 to 450.000 marks in the 1930's.

The beginning of the pools system, however, was the factor which affected decisively the finances of Scandinavian sport activities. The national pools office was founded in Finland in 1940. According to the Statute on Pools the whole profit was first used on the promotion of sport and physical education. Later the portion of profits used on sport has several times been cut down, and at the moment it is 45 per cent.

The profit from pools increased rapidly after the war. In 1947 about 200.000 marks of the profit were used on sport activities and two years later almost 2 million marks. The 5 million marks limit was passed in 1951 and 10 million marks in 1954.

In Sweden the appropriation remained as late as the 1930's around 100.000 crowns (Scr) (Figure 1). At the lowest it was in 1915 (300.000 crowns) and the highest in 1920 (150.000 crowns).

In 1934 the government founded the Pools Service (Tiptjänst) and a special Foundation for the Promotion of Sports was set up to distribute the profits. 50 per cent of the profit was allocated to sport and because of this sport support increased considerably. In 1936 it was over 1 million crowns and in 1938 as high as 6 million crowns. During World War II the aid decreased substantially and a balance was not gained until in 1947, when the allocation had risen to 4 million crowns.



FIGURES 1 and 2. The distribution of State financial aid on sport in Sweden and Finland in the years 1913-30.

In Norway and Denmark as well the development followed the general Scandinavian model. Pools were the most outstanding source of finance there, too. In Norway pools profits were allocated for scientific and sport purposes so that the first million was used on sport, of the second million 80 per cent, of the third 60 per cent, of the fourth 40 per cent and of the remaining portion 20 per cent was used on sport. In the 1948 Law on Pools a corresponding principle was applied in Denmark as well.

During the first few years of financial aid the primary objects for aid were sport organizations. The main purpose was to promote their training and information activities. Table 1 presents the state financial aid to the most important central organizations in Finland, Norway and Denmark during the last few decades. The figures show that state financial aid has increased most in Finland and least in Norway.

TABLE 1. State financial aid to certain sport organizations in Finland, Norway and Denmark in 1910, 1920, 1930, 1940 and 1950 (The amounts expressed in the currency of each country respectively).

Country	Central organization	in 1910	in 1920	in 1930	in 1940	in 1950
Finland	SVUL		85.000	300.000	382.500	63.000.000
"	TUL		60.000	250.000	235.000	30.000.000
"	CIF		12.000	36.000	15.000	9.250.000
Norway	NIF	12.000	250.000	80.000	100.000	830.000
Denmark	DIF	6.000	40.000	43.000	63.500	1.565.000

After 1940 financial aid in Finland has been directed mainly to supporting the activities of sport organizations, building sport facilities (first athletic fields) as well as supporting sport institutes. On the other hand, the role of central sport organizations such as Finnish Central Sports Federation (SVUL), Workers' Sports Federation (TUL), Finnish Football Association, Finland's Swedish Central Athletic Federation (CIF) and later the Central League of Workers' Sport Clubs (TUK) in the allocation of funds is still very significant.

When the Provincial Sports Commissions were founded in Finland in the 1950's they were first allocated the sum of 10.000 marks in special aid. Later the contribution was included in the budget of the State Sports Commission and it changed into a yearly allowance which had to be applied for.

As early as the 1920's small contributions were given to scientific purposes, but the substantial support of scientific activities did not start before the end of the 1950's. In 1955 35.500 marks were allocated to research and other scientific activities, in 1960 the amount was 100.000 marks and in 1969 670.000 marks. Figure 3 shows that the proportion of scientific work in the state financial aid for sport is very small. In 1969 it represented only 0.3 per cent of the total cost of sport activities.

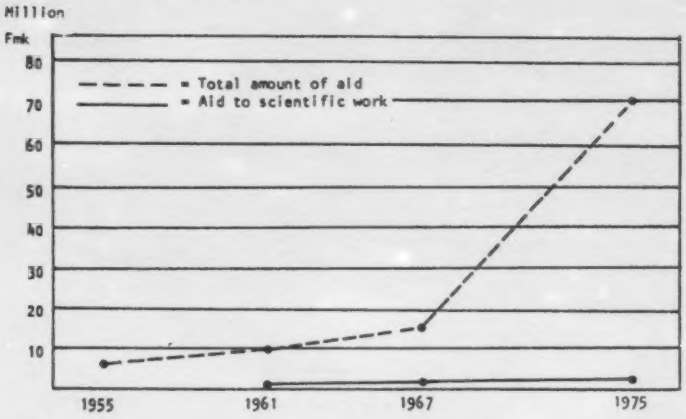


FIGURE 3. State financial aid to sport in Finland in 1955-1975.

In addition to the main groups described above state financial aid has to a smaller extent been allocated to many different objects. Among these are preparation and participation in Olympic Games, competitions abroad, congress and study travel organization of seminars, publishing etc.

In Sweden the allocation of financial aid brought about strong controversy between the Gymnastic Association and the Swedish Central Sport Federation (RF). The portion of the Gymnastic Association from the total contribution was about one fourth during the first years. It temporarily decreased, but in the middle of the 1920's it was one half of the aid allocated to the central organization. In some years the Gymnastic Association received even more financial support than the central organization. This strange situation was caused by the fact that Ling's gymnastics was favoured by the state. In many respects the Gymnastic Association was considered an independent organization and it had many other privileges as well. An interesting initiative, even though it did not receive enough support, was taken by communists in the 1933 Diet. They proposed a sum of 10.000 crowns to be given to Workers' Sport Federation. The historical background was, however, different in Sweden from that in Finland where civil war had led to establishing a workers' central sport organization. Differentiation did not take place in Sweden and financial aid was allocated to one national central organization.

The financial foundation of sport has developed along similar lines in the Scandinavian countries. The predecessor in state financial aid during the first years was Sweden whose example the other countries followed. Traditionally active Scandinavian cooperation in sport has encouraged similar development. This cooperation has been especially close between Sweden and Finland. There are, however, differences in sport finances. erhaps the most significant difference between Finland and other Scandinavian countries is a result of the political role of central sport organizations. The powerful position of workers' sport movement has meant that sport and of course sport finances are in Finland more strongly related and bound to party politics and the labour union movement.

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PHYSICAL FITNESS OF YOUNG FINNISH MEN

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1. INTRODUCTION

It has been suggested that the physical fitness of Finnish children and young people has deteriorated (Hallman 1975, KomM 1976:87). Minimal physical activity of every day living has been supposed to be a reason for this. The alterations of physical education in schools, especially too large teaching groups, are said to promote the same trend (Vilhunen 1976). Because of the lack of follow-up studies of physical fitness there is no scientific evidence for supporting those suggestions. The results on the physical fitness of primitive tribes do not however support suggestions that technical development could directly decrease the physical fitness of people (Cumming 1967).

Earlier results on the maximal oxygen uptake ($\dot{V}O_2$-max) of young Finnish men are based on predictions which show that the $\dot{V}O_2$-max of young Finnish men is below the international averages (Heikkinen et al. 1969, Vuori et al. 1978). On the other hand the results on the Cooper tests performed in Finnish Armed Forces indicate that more than 50% of the recruits have good physical fitness in the beginning of conscription (Hintsala 1977). This is the case although the classification limits of physical fitness in Finnish Armed Forces are about 200 meters higher than those recommended to be used in the Cooper test (Cooper 1968).

The purpose of this study was to declare the physical fitness of young Finnish men and its connections both to smoking habits and to sports behavior. In this purpose some physical fitness tests and a questionnaire of smoking habits and sports behavior were performed in a group of randomly selected recruits.

2. MATERIAL AND METHODS

2.1. Subjects

The subjects (n= 58) were randomly selected among healthy recruits (born in 1956) of two garnisons (Keuruu and Mikkeli). Twenty-eight of the men began their conscription in June and the rest in October. The anthropometric and physiological characteristics of the subjects are given in table 1.

TABLE 1. Anthropometric and physiological characteristics of subjects ($\bar{X}$ ±S.D.)

Variable x)	n	
Age (years)	58	20.1±0.3
Height (cm)	58	177.8±6.7
Weight (kg)	58	69.1±8.4
BSA (m^2)	58	1.86±0.13
BMI	58	21.9±2.4
%F	57	12.7±4.6
LBM (kg)	57	60.1±6.2
VC (l)	55	5.8±0.7
Heart rate at rest (beats·min^{-1})	55	64±9
Systolic blood pressure (mmHg)	57	132±12
Diastolic blood pressure (mmHg)	57	80±10

x) For abbreviations see text

2.2. Experimental techniques

The subjects' sports behavior, smoking habits and subjective prediction of physical fitness were examined by questionnaires immediately after the beginning of conscription.

Vital capacity (VC) was measured in standing position (Vitalograph, Spirometer, BTPS), the percentage amount of body fat (%F) was predicted by skinfold thickness measurements (Durnin & Rahaman 1976) and the body mass index (BMI) was calculated according to Keys et al. (1972).

The maximal oxygen uptake was measured during an incremental bicycle ergometer ride (Mijnhardt Universal, 60 rpm). Expiratory gases were collected during the last two loads by the Douglas-bag method and analyzed by the Scholander technique (Consolazio et al. 1963). The highest measured oxygen uptake was considered as $\dot{V}O_2$-max (l/min, STPD). Heart rate (HR) was calculated from EKG registered by a Hellige EKG 27 at the end of every workload. The highest measured HR was considered as HR-max.

The anaerobic capacity was measured during one minute ride on a belt-friction ergometer with maximal revolution speed against a constant force (5 kp). The amount of revolutions were registered and the results ($W \cdot kg^{-1}$) were calculated by dividing the performed work by body weight.

The results of the Cooper test were registered by the accuracy of 10 meters.

Venous blood samples for the entzymatic estimation of whole blood lactate (LA) was taken from ante cubital area 3 minutes after both the maximal ergometer loading and the Cooper test. These blood samplings and the heart rate palpation after the Cooper test were arranged only for recruits in Mikkeli.

2.3. Statistical methods

Standard procedures were used to calculate means and standard deviations. The correlation coefficients were calculated using the largest possible number of subjects in each calculation. The significance of the differences were calculated by X^2-test, t-test (2P) and ANOVA depending on the level of the measurement.

3. RESULTS

Most of the subjects (71 %) were living in rural areas. 70 % had only the Finnish 8-year obligatory education and 50 % had no professional education.

More than one third of the men reported that they participated regularly (at least 2-3 times per week) in leisure-time physical exercise both in winter (38 %) and in summer (43 %). Only 12 % of the subjects participated in competitive sports. More than half (53 %) of the men were daily smokers and 77 % of them smoked more than 10 gigarettes per day. 21 % reported that they had increased their physical exercise during the last few weeks before conscription.

The results of the physical fitness tests are shown in table 2. The measured maximal oxygen uptake per body weight ($\dot{V}O_2\text{-max}_{dr}$) was 11 ± 9 % higher than the corresponding predicted value ($\dot{V}O_2\text{-max}_{pr}$). When $\dot{V}O_2$-max was predicted from the Cooper test by using the original regression of Cooper (1968), the result was 48.8 ± 7.1 $ml \cdot kg^{-1} \cdot min^{-1}$ which was 10 ± 8 % lower than $\dot{V}O_2\text{-max}_{dr}$ (see table 2).

TABLE 2. Results of physical fitness tests ($\bar{X}$ ± S.D.)

Variable	n	
$\dot{V}O_2\text{-max}_{da}$ ($l \cdot min^{-1}$, STPD)	55	3.80 ± 0.6
$\dot{V}O_2\text{-max}_{dr}$ ($ml \cdot kg^{-1} \cdot min^{-1}$)	55	55.0 ± 7.1
$\dot{V}E$-max ($l \cdot min^{-1}$, BTPS)	55	124.6 ± 21.7
HR-max ($beats \cdot min^{-1}$)	55	191 ± 8
RQ	55	1.1 ± 0.1
$\dot{V}O_2\text{-max}_{pr}$ ($ml \cdot kg^{-1} \cdot min^{-1}$)	55	48.9 ± 6.0
PWC_{170} (W)	55	197 ± 35
Cooper test (m)	57	2690 ± 320
Heart rate in the Cooper test ($beats \cdot min^{-1}$)	25	166 ± 12
LA in the ergometer test (mmol/l)	27	9.5 ± 1.4
LA in the Cooper test (mmol/l)	26	7.9 ± 2.3
Anaerobic capacity ($W \cdot kg^{-1}$)	52	5.8 ± 0.6

Both the blood lactate concentration and heart rate were significantly lower ($p < .01$-$.001$) for the Cooper test when compared to the ergometer test. Both positive and negative correlations ($p < .05$) were found between the variables describing body composition and physical fitness (Table 3).

TABLE 3. Correlations between anthropometric and physical fitness variables.

	1	2	3	4	5
1. Weight					
2. % F	$.53^{xxx}$				
3. $\dot{V}O_2max_d$ ($l \cdot min^{-1}$)	$.53^{xxx}$	$-.15$			
4. $\dot{V}O_2max_{dr}$ ($min \cdot kg^{-1} \cdot min^{-1}$)	$-.19$	$-.50^{xxx}$	$.73^{xxx}$		
5. Cooper test (m)	$-.16$	$-.32^{x}$	$.63^{xxx}$	$.75^{xxx}$	
6. Anaerobic capacity ($W \cdot kg^{-1}$)	$-.40^{xxx}$	$-.54^{xxx}$	$.38^{xx}$	$.64^{xxx}$	$.46^{xxx}$

($x = p < .05$; $xx = p < .01$; $xxx = p < .001$)

When divided into rural and urban groups the subjects showed no significant differences in participating in physical exercise, in average $\dot{V}O_2$-max_{dr}, in the Cooper test or in the anaerobic capacity.

Those who regularly participated in physical exercise had higher $\dot{V}O_2$-max_{dr} and better result in the Cooper test compared to those with less physical exercise (Table 4). No significant difference in the anaerobic capacity between these groups was found. Those who before conscription had increased their physical exercise (n=10) had significantly higher ($p < .05$-$.001$) results in $\dot{V}O_2$-max_d and Cooper test compared to the results of the others (59.5 ± 8.4 ml$\cdot$kg$^{-1}\cdot$min^{-1}, and 2990 ± 400 m vs. 53.8 ± 6.2 ml$\cdot$kg$^{-1}\cdot$min^{-1} and 2610 ± 230 m respectively). No significant difference in the anaerobic capacity of these two groups was found.

The non-smokers had significantly higher ($p < .01$) $\dot{V}O_2$-max_{dr} (58.1 ± 7.7) and better Cooper test result (2840 ± 360 m) than the daily smokers (52.4 ± 5.4 ml$\cdot$kg$^{-1}\cdot$min^{-1} and 2570 ± 220 m). No difference was found between these groups in participating in physical exercise or in anaerobic capacity.

TABLE 4. $\dot{V}O_2\text{-max}_{dr}$ and Cooper test according to participating in physical exercise in winter and in summer.
(I = participation in physical exercise once a week or more rarely,
II = participation in physical exercise 2-3 times per week or more often)

WINTER	I	n	II	n	2 p
$\dot{V}O_2\text{-max}_{dr}$	52.8 ± 5.3	35	58.9 ± 8.2	20	.01
Cooper	2610 ± 180	35	2810 ± 430	22	.05
SUMMER					
$\dot{V}O_2\text{-max}_{dr}$	52.7 ± 5.2	31	58.0 ± 8.2	24	.01
Cooper	2570 ± 200	33	2860 ± 370	24	.001

According to the subjective prediction (classification) of physical fitness (endurance) there were significant differences ($p < .05$-$.001$) in the results of $\dot{V}O_2\text{-max}_{dr}$ and the Cooper test (Table 5). When the subjects were divided into similar groups according to subjective prediction of muscular power no significant differences were found in the anaerobic capacity.

TABLE 5. $\dot{V}O_2\text{-max}_{dr}$ and Cooper test according to subjective prediction of physical fitness (endurance) ($\bar{X}$ ± S.D.).

	SUBJECTIVELY PREDICTED PHYSICAL FITNESS						
	I Very poor/ poor	II Average	III Good/very good	F	I/ II	I/ III	II/ III
					p <		
$\dot{V}O_2\text{-max}_{dr}$ ($ml \cdot kg^{-1} \cdot min^{-1}$)	51.5±6.3 (14)	54.6±5.6 (33)	62.8±8.8 (8)	8.45	.05	.01	.001
Cooper (m)	2500±150 (15)	2650±220 (34)	3200±370 (8)	24.49	.05	.01	.001

4. DISCUSSION

The subjects of this study were healthy Finnish men at the age of 20 years. Their anthropometric and basic physiological characteristics were in good agreement with earlier findings of Finnish men at the same age (Viitasalo et al 1977).

About 40 % of the subjects participated regularly (2-3 times per week) in leisure-time physical exercise. This percentage was somewhat higher than reported earlier on similar age groups (Kannas 1978, Laakso 1976). This difference can be explained to some extent by the fact that 1/5 of the subjects had increased their physical exercise before conscription in order to improve their physical fitness.

The smoking habits of the subjects were in a good accordance with the findings of Kannas (1978) and Rimpelä et al.(1977).

Based on the results mentioned above the subjects can be said to represent quite well Finnish men at the age of 20 years, although the number of the subjects was small.

$\dot{V}O_2$-max values measured during bicycle ergometer loading are about 5-7 % lower than those recorded in treadmill running (Clausen 1977, Åstrand & Rodahl 1977). Because of the fact that a part of the subjects had very little running experiences and because there were not time enough to familiarize them with treadmill running, the bicycle ergometer loading method was used.

The regression equation between oxygen consumption and work power (figure 1) agrees with that reported earlier (see Åstrand & Rodahl 1977). The coefficient of the method used has been found to be .98 (Rahkila 1979).

The maximum of the results of the subjects not accustomed to maximal efforts is a problem of the stress testing methodology. In this study subjects were verbally motivated during ergometer loading.

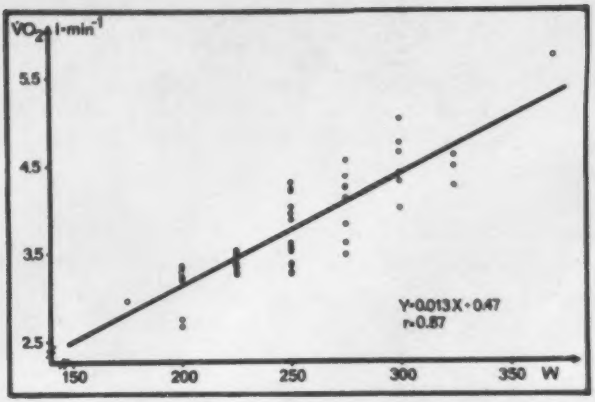

Figure 1. The regression equation between oxygen consumption ($\dot{V}O_2$ $l \cdot min^{-1}$) and work power (W). (n = 55)

The commonly used criterions fot the maximum of physical performance are a) lactic acid concentration in blood over 8-9 mmol/l, b) respiratory exchange ratio (RQ) over 1.0 and c) the heart rate near the age-predicted maximum (Åstrand 1976). All these criterions were reached in our measurements and therefore the oxygen consumption results can be considered as maximum. On the contrary both the blood lactate concentration and the heart rate after Cooper test indicate that this kind of running test must be considered as submaximum.

Despite of the homogeneity of the group in respect to age a wide variation in physical fitness was noticed. This was true both in absolute ($l \cdot min^{-1}$) and relative values ($ml \cdot kg^{-1} \cdot min^{-1}$) of $\dot{V}O_2$-max and also in the other variables (Cooper test, PWC_{170}, anaerobic capacity). These findings reflect differences in the heredity, body composition and physical activity of the subjects.

Klissouras (1976) has found that heredity explains over 90 % of the variability in $\dot{V}O_2$-max in populations exposed to common environmental forces. The positive correlation of $\dot{V}O_2$-max ($l \cdot min^{-1}$) to body weight

is commonly noticed (for ref. see Davies 1972). The body fat (% F) correlated negatively to $\dot{V}O_2$-max$_{dr}$ ($p < .001$) and to Cooper test ($p < .05$). This difference in the correlation of body weight and body fat to physical fitness is due to the methods used in the estimation of physical fitness: contrary to the bicycle test the subject has to bear his own weight in the Cooper test.

It has been found that even a moderate aerobic training of few months improves $\dot{V}O_2$-max of people in poor physical fitness (for ref. see Holloszy 1973). In this study the subjects who regularly had participated in physical exercise at least 2-3 times per week had significantly higher results in bicycle ergometer and Cooper tests compared to physically less active ones. When this less active group was still dichotomized (exercise once a week/exercise fewer) no differences were found between these groups. Our finding supports the conception that physical exercise performed regularly 2-3 times per week at least maintains physical fitness. No difference in the anaerobic capacity of the respective groups was found. According to the questionnaires the performed exercises were aerobic by nature which explains the significant difference in the aerobic fitness and the lack of difference in the anaerobic capacity.

There was also a significant difference in physical fitness ($\dot{V}O_2$-max and Cooper test) between daily smokers and non-smokers. Because the non-smokers were not more active physically than smokers and because no difference in the anaerobic capacity was found, smoking seems to influence primarily to the aerobic fitness of young men. Earlier finding of Ingemann-Hansen & Halkjaer-Kristensen (1977) supports this conception.

Earlier studies concerning the physical fitness of young Finnish men (Heikkinen et al. 1969, Vuori et al. 1978) have been based on predictions of $\dot{V}O_2$-max. Coleman (1976) has reported that the results of $\dot{V}O_2$-max obtained by prediction are about 10 % lower than those obtained by direct measurements. Our results support this conception. The most typical reasons for the unreliable results of prediction are uncontrolled work power and age-predicted HR-max. Surprisingly few authors have paid attention to these disadvantages when using predicted values as fitness determinants. According to our experiences one has to be careful when making interindividual comparisons and also group level conclusions by results based on predictions of $\dot{V}O_2$-max. Significant but rather low correlations

of $\dot{V}O_2$-max_{dr} both to $\dot{V}O_2$-max_{pr} and to Cooper test support the suggestion of Wright et al. (1978) that submaximal tests performed under carefully controlled conditions can be used when following intraindividual variation in physical fitness.

We have gathered results of physical fitness tests performed on young men in different countries into table 6. Compared to those results our results do not support earlier suggestions on poor physical fitness of young Finnish men. According to our conception the physical fitness of young Finnish men is at least up to the international average. This is true although the mean of physical fitness in this study was to some extent increased by those who consciously had tried to improve their physical fitness before conscription.

It was surprising to find out that the subjectively predicted physical fitness (endurance) was in a good accordance with the measured fitness ($\dot{V}O_2$-max_d and Cooper test). Because subjective predictions were made before participating in any physical exercise in conscription they could not be based on interindividual comparisons. Consequently it seems to be possible to use subjective predictions in the grouping of people into crude categories of aerobic fitness.

When the connections between subjectively predicted muscular power and measured anaerobic capacity were studied no similar results were found. The reason for this is likely in the testing method of muscular power (one minute ride). On the other hand the physical exercises subjects had performed in leisure-time give only a weak base on the prediction of muscular power.

TABLE 6. The results of the physical fitness tests performed on young men.

REFERENCE	SUBJECTS	n	Age	$\dot{V}O_2$-max $l \cdot min^{-1}$	$ml \cdot kg^{-1} \cdot min^{-1}$	PWC_{170}, W	Cooper test, m
Vainikka & Rahkila	recruits	55	20.1	3.80	55.0	197	2690
Rahkila (1977)	malestudents	13	23.0	3.67	53.8	-	-
Ahlborg (1966)	recruits	31	20.8	-	-	193	-
Edgren et al. (1976)	recruits	44	20.6	3.60	51.4	210	-
Hartling (1976)[2]	recruits	137	20.3	-	45	-	2382
Nylind et al. (1978)	recruits	55	19.4	-	-	178	-
Burger & Klimes (1973)	recruits	25	-	3.0	-	226	-
Burke (1976)[1]	malestudents	44	22.2	4.13	52.8	-	2934
Coleman (1976)[1]	physical educator students	15	22.7	4.49	55.1	-	-
Howald et al. (1975)[1]	fair visitors	79	21-30	-	58.1	-	2973
Wiley & Shaver (1972)[1]	malestudents	35	20.8	3.80	52.6	-	-
Vogel & Patton (1975)[1]	recruits	73	17-20	-	53.3	-	-

1) treadmill loading

2) predicted $\dot{V}O_2$-max

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REPORTS OF PHYSICAL CULTURE AND HEALTH
1975-1977

Abstracts

* Physical Education of Preschool Children

NURMI, HELI & SIREN, HELENA, Alle kouluikäisten liikunta: kouluunmenoikäisten lasten motorisen kunnon ja perusliikunnan mittaus ja yhteyksien selvitys.
[The physical education of preschool children: measurement and explanation of relations in motor ability and field of basic movements of children of school age.]
Jyväskylä 1975. 69 p. Reports of Physical Culture and Health 4.

This is a preliminary report of a project on children of the ages of 3-6 years. The sample comprised 21 boys and 22 girls. The reliable variables for reflecting essential phases of change in the development of physical performance capacity were strength of body and arms, 40 m run, takeoff in jump, distance and target in throwing and the performance time in catching up and throwing a ball against wall. Then the developing of quality evaluations for basic movements was done, that would have had great importance for practical evaluation, only the evaluations of distance throwing were found out to be reliable. Even in this small sample, the differences between children were distinct in each aspect. The variance in both of the two testing sessions was interpreted significantly (34-71%) with sex in distance throwing and target throwing and in long jump. Four factors were grouped in performance of girls and boys, of which the intensity of moving (jumping) and dexterity had the most constant context. The 3rd factor was loaded with different throwing and catching-up tasks and the 4th with body and arm strength in all and in agility running in boys.

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NURMI, HELI & SIREN-TIUSANEN, HELENA, Alle kouluikäisten liikunta: ulkoliikuntaleikit kouluunmenoikäisten lasten perusliikunnan kehittäjinä: metodinen kokeilu.
[The physical education of preschool children: outdoor games as a means of developing the basic movements of children of school age: methodological experiment.]
Jyväskylä 1975. 42 p. Reports of Physical Culture and Health 12.

Research methods were used to experiment with ways of developing the early physical education tradition in Finland as far as it concerns outdoor games of the oldest age group in day-care centres. Games suitable for the entire age groups and developing basic motor skills were selected from classified games material. Eight of these were then tested for three weeks at a day-care centre. A pedagogical test was taken as the model of developing the research methods. Only indicatory results were obtained of the development potential of games. Important was the information obtained of knowledge of sport, the games children knew, and the conditions and reasons for taking part in them. Children's

physical activity was linked with their knowledge of games. They were only eager to join in games they could master well. The participation of a teacher increased the activeness and interest of all children to participate. The differences in motor development are great even by school age. Purposeful direction of sport and physical education and reforming of false habits are required. Social upbringing is important, for movement games have a rich and diverse potential. The inventing of various variations and additions to games should be encouraged.

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* Research on School Physical Education

NUPPONEN, HEIMO, Plan for a programme of research on school physical education in Finland in 1975-1979. Abridged version. Jyväskylä 1976. 61 p. Reports of Physical Culture and Health 14.

By the end of 1974 about 150 school physical education studies had been made in Finland. The number of studies has risen greatly in recent years, though there have been considerable annual variations. About 2/3 of the studies have been concerned with problems of implementation. There has been very little research into goals and planning, or into physical education for preschools, special and vocational schools. About 1/4 of academic theses have been concerned with physical education at school. The economic resources have not followed the growth in funds of research in physical education and sports. Of these funds, about 5 per cent have annually been spent on research into physical education at school. The researcher resources are also small.
The system for school sport activities is divided into two parts: separate examination of societal functions of school sport and its inner functions. Typological examination of the research tasks is made in the disportion of three classifications (object, time, implementation). Order of urgency and importance should be as follows: 1) functional-based and 2) goal-based research. The former is aimed at the significance of school sport from the point of view of individuals and society. The latter signifies research directed at measurement of goals, reasons, topicality and existing goals. In addition to these general principles, the important areas of research are defined as the study of 1) further development of goals, 2) physical performance capacity and 3) level of interest in sports-like physical activity. This is an English abridged version from the main report No. 7 (in Finnish), which has also been published in a Finnish abridged version, No. 8.

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NUPPONEN, HEIMO & TELAMA, RISTO & TÖYLI, VELI-MATTI, Koulun kuntotestistö.
[Fitness test for schools.]
Jyväskylä 1977. 85 p. + test cards.
Reports of Physical Culture and Health 19.

The fitness test book for schools is a product of the research project on school physical education carried out in the Research Institute of Physical Culture and Health. The book concerns evaluation system for physical fitness and presents a measurement method of fitness. The test battery is based on tests constructed by the International Committee for standardization of physical fitness tests. It can be applied to those of 6 to 32 year of age and also to both sexes. This book presents the norm scores for 10 to 18 year-old ones, and the tests are consequently recommended to be used not earlier than in the age of 10 to 11 or at the 3rd and 4th grade levels in schools. It is especially emphasized, that tests can be chosen in different amount depending on time, facilities, equipment and on the need for exactness in various cases.
The book is foremost designed for physical education teachers in various schools. It can also be applied for the functions of sport organizations, physical fitness clubs and individual persons.

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* Population's Sporting Behavior

KIVIAHO, PEKKA, Sport and intracultural social change: a longitudinal analysis.
Jyväskylä 1976. 38 p. Reports of Physical Culture and Health 13.

The economical and social changes of advanced countries have affected the development and growth of sport federations for the past fifty years. The report focuses on the ways in which changes in the development of organized sport reflect politico-structural changes in society and what factors are linked with them. Finland is regarded as a good concern of research, because of the differentiation of sport movement after the civil war in 1919 and the enormous growth of sport federations support after the World War II. The main target federations are the Finnish Central Sport Federation and the Workers' Sport Federation. Social cleavages between the working and bourgeois classes, between ethnic groups (Finnish and Swedish speaking populations) and different socio-economic factors have affected the development and growth of federations both quantitatively and qualitatively. Changes in the support for the Central Federation is more dependent on general socio-economic conditions, whereas the support of the Workers' Federation with its closer leftist and labour movement ties is more closely and directly connected with factors affecting the position of workers in society or their internal organizations. In spite of many levelling factors, the connections are reflected in the development conditions of the two organizations even during the period after the World War II. However, there are differences in the explanation of support during the pre-war period and post-war period. During the present and more stable political and social situation, the effect of political factors has been in a way institutionalized.

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* METELI-PROJECT

METELI. Kolmen metallitehtaan henkilöstöjen elinolot ja elämäntapa.
[METELI. The general life conditions and mode of living of employees in the machine industry.]
Jyväskylä 1975. 182 p. Reports of Physical Culture and Health 1.

In this report the groupings and recruitment of the employees according to the division of work in the factories are described. Of the living conditions outside work, data of the following fields are studied: a) the distributions of salary, b) consumers' goods and c) quality of housing as well as d) the system of everyday behavior encompassed by the concept "mode of living" (family, home chores, leisure activities). A general conclusion is that those who are better situated occupationally (more education, better working environment and nature of work) are better also with respect to their life conditions outside work (more economic resources, higher housing standards, more extensive and richer modes of leisure activities). - A starting point for the investigation was the view that work is a primary factor in forming the quality of life for man, and that the effects of division of work within the industrial organization extend to life conditions outside work.

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METELI. Työympäristöt metallitehtaissa: pölyn, melun, tehollisen lämpötilan ja valaistusvoimakkuuksien jakaumat sekä niiden vaihtelut kolmessa konepajateollisuuden tehtaassa.
[METELI. Working environments in the machine industry: the distribution and variations of silica dust, noise, effective temperature and illumination in three plants of the machine industry.]
Jyväskylä 1975. 157 p. Reports of Physical Culture and Health 2.

The population of the study comprised all the individual workplaces in three plants of the machine industry. A sample of 320 elements was obtained from the population by a proportionate stratified systematic selection. Several measurements of industrial environment factors were made in the workplaces included in the sample. Seasonal variation of observations was described and analysed by classifying observations according to the stage of production. The results showed that the majority of the workers in the plants concerned work in environments which cause psychophysical stress. The handicaps measured in terms of different environmental variables are the greater the closer we get to the early stage of the production chain.

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METELI. Työolot metalliteh taissa: työn luonteen ja työympäristöjen piirteitä kolmessa konepajateollisuuden tehtaassa.
[METELI. Working conditions: the character of work and working environments in three plants of the machine industry.]
Jyväskylä 1975. 179 p. Reports of Physical Culture and Health 3.

The general aim was to describe the working conditions of the employees in machine industry, work load, stress, and satisfaction at work. The results showed that the character of work and several related factors concerning load, stress and overall comfort are consistently determined by a person's position in the work process so that the working conditions were generally speaking more loading, stress symptoms more common and the comfort of the working conditions lesser at the early stages of production process than among persons employed in planning and administrative tasks or in office work in general. The physical loading of work was the most significant characteristic of work that causes stress and reduces comfort and satisfaction. In addition, the inadequate compatibility between work requirements and personal abilities was a significant factor causing dissatisfaction with working conditions.

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METELI. Congress reports 1974.
1. Telama, Risto, Physical activity and sport in the leisure time of employees of the machine industry in Finland: a preliminary report. P. 1-19.
2. Kirjonen, Juhani, Sport and physical capacity for work. P. 21-48.
Jyväskylä 1975. 48 p. Reports of Physical Culture and Health 5.

Telama. Risto. Physical activity and sport in the leisure time of employees of the machine industry in Finland. - The purpose of the present study was to make a comprehensive analysis of the role of various forms of physical activity and of institutional physical culture in particular in the industrial workers' use of leisure and physical activity. The use of time and physical activity were studied quantitatively and qualitatively as well as their relations. Information about the frequency of participation in different forms of physical activity, involvement in organized sport and motivation for sport and physical activity as well as social background, health and work were collected by means of structured questionnaire, which was given to a stratified sample of 1640 subjects with the return of 82 percentages. In the second phase, 902 subjects were selected from the original population by stratified sampling, and they were studied individually in a sociological and medical investigation and interviewed about their physical activity during leisure time. Moreover, the subjects filled in a time budget diary during four days at home after being instructed as a group how to do it. The results indicate that institutional sport and physical activity have little significance for people's physical activity when compared with other kinds of moving and necessary home chores. The use of leisure and sports-like physical activity seems to be connected with people's total use of time, type of work, socioeconomic status and sex.

Kirjonen. Juhani. Sport and physical capacity for work. - The purpose was to describe what kind of differences can be found in health, particularly in functional capacity, of people engaged in various stages of production. Health examination was carried out in spring 1973. The sample of male subjects consisted of 609 persons. The data were com-

piled by questionnaire and interviews. Measurements of health and physical fitness were also made. This preliminary report gives a description of how the expenditure of time of various groups of employees is distributed and what is the proportion of work and physical activity out of the total time spent. The health status is described by examining functional capacity and socially significant morbidity. The relations of amount of physical activity and age and occupational status are studied and also the health status of workers and clerical personnel as influenced by the amount of their physical activity.

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METELI. Terveystutkimus: otanta, menetelmät ja toteuttaminen.
[METELI. Health examination: sampling, methods and implementation.]
Jyväskylä 1975. 279 p. Reports of Physical Culture and Health 9.

Planning, methods, data and implementation of health examination, which is one of the principal sectors of the METELI research project, are discussed in the report. The health examination was carried out as a cross-section study, and it comprised a sample of about 300 women and 600 men representative of occupational groups working in three machine industry plants. The text proper is augmented with an appendix section including all questionnaires used, list of variables and their distributions, etc. The report does not include the actual results of the examination, which are to be published separately. The report is best suited for use as curriculum material in the teaching of research methodology at university level.

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METELI. Terveystutkimuksen mittausohjeisto.
[METELI. Measurement guide of the health examination.]
Jyväskylä 1975. 70 p. Reports of Physical Culture and Health 10.

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METELI. Kolmen metallitehtaan henkilöstöjen liikuntakäyttäytyminen.
[METELI. Leisure time sport and physical activity of employees in three plants of the machine industry.]
Jyväskylä 1975. 275 p. Reports of Physical Culture and Health 11.

The purpose of this study was to examine the role that physical activity plays quantitatively and qualitatively in the life of employees and to analyze this activity from the viewpoint of leisure interests and other kinds of social involvement, use of time, living conditions, and health. This behavior has been comprehended to comprise all goal-oriented physical activity like physical activity required at work, in home chores, physical activity in traffic and interest in physical activity. Also involvement in sport through individual participation belongs to this behavior. In this report physically active behavior outside the work-situation is studied. Physical activities are divided into physical activity required in industrial production and industrially non-productive leisure time sport and physical activity.As to physical activity in production, participation in and attitudes to non-work physical activity in one's workplace and during commuting are studied. Leisure time physical activity is further divided into organized and non-organized activity. Motivation and use of sport services are described in this connection. Regarding organized sport involvement in sport and consumption of sport are described. The former comprises affiliation to competitive sport organization or choice of organization, participation in club activities, interest in competitive

sport, a.o. - and the latter attending competitive sport events as spectator or following events in mass media. The results describing the role of sport and physical activity are discussed in relation to sex, age, specialfeatures of work, background of former socialization, one's class status and status in the social stratification and general living conditions. Also the relations between different contributing factors are analysed.

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METELI. Ammattiasema, työolot ja sairastavuus metalliteollisuuden henkilöstöryhmissä.
[METELI. Occupational position, working conditions and morbidity among employees of machine industry.]
Jyväskylä 1977. 195 p. Reports of Physical Culture and Health 18.

The aim of this part of the METELI research program was to find out the differences in morbidity among the employees of machine industry according to occupational status, age and sex groups and the connections between certain specific aspects of working conditions and morbidity. Special attention was paid to the occurrence of diseases and symptoms in the locomotor system and stress symptoms (psychological and psychosomatic symptoms), because they can be considered to reflect occupational health problems typical of semiautomated technology. The population of the study comprised a sample of 902 persons. Collection of data was carried out extensively so that questionnaires, interviews, clinical examination and physiological measurements completed each other.
The position in the production process and the specific aspects of working conditions were clearly reflected in the status of health of the examined population. The lowest morbidity occurred among the managerial staff, it was higher among the clerical staff and skilled workers and highest in the group of semiskilled workers. In the employee groups of the highest morbidity, locomotor diseases, psychosomatic stress symptoms and other diseases as well as temporary disability, chronic diseases and premature retirement were common. Stress symptoms were most common with those whose jobs were most force paced and least interesting and in whose working environments the various harmful physical and chemical effects were most plentiful. The most degenerated condition of locomotor system was with the workers whose job characteristics, according to the ergonomic observations carried out at work places, were most loading.
The prevalent tendency is to change the focus of public health care into the direction of preventive health care, because the most common diseases can only to a limited extent be cured by therapeutic medical science. As many of the factors directly connected with morbidity are to be found in working conditions, more attention should be paid to labour protection. It should be seen in a wider context as an essential form of public health activities aimed at the working population.

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• Socialization into Sport Involvement

LAAKSO, LAURI, Jyväskylä3l3isten nuorten aikuisten liikuntaharrastukset.
[Leisure time sport activities of young adults in Jyväskylä.]
Jyväskylä 1976. 63 p. Reports of Physical Culture and Health 16.

This report is the first part of a large research project the purpose of which is to explain leisure time sport activities at adulthood with help of variables describing childhood and youth. The purpose of this part was to describe leisure time sport activities and their development from childhood to adulthood in the group of young adults. A random sample of 300 was drawn from a population between ages 26 and 32 living in the town of Jyväskylä. In the first stage, they were asked about their sport activities by means of mailed questionnaire and in the second stage they were interviewed personnally. The results indicated that 62% of the subjects had participated in sport during the last 12 months and 34% had participated at least twice a week. Fourteen per cent of the subjects were members of a sport club and 5% of them had participated in competitions. Walking, cross-country skiing and swimming were the most popular activities. In women's group, the sport activities were best explained by below-school-age children and in men's group by the duration of residence in the dwelling place.

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• Top Athletics as a Content of Life

VUOLLE, PAULI, Suomalaisen huippu-urheilijan elämänura.
[Life-career of Finnish top-level athlete.]
Jyväskylä 1976. 128 p. appendices.
Reports of Physical Culture and Health 17.

The report presents research findings on Finnish top-athletes' social background, occupational, educational and social status and the making of sports career and factors affecting its development. The population of the study was the most successful male athletes during the Olympic years from 1956 to 1972. They represented 21 sport disciplines. They were divided into representatives of team sport and individual sport as well as active athletes and those who had finnished their sport career at the time of the mail inquiries (1972/1973).
Top-athletes' educational level and occupational status have, on the average, been higher and association activity generally more common than in the male population of respective age groups in the whole country. This can be considered to follow from at least three facts. 1) Compared to the average population athletes come more often from urban settings where educational, occupational and social participation is more easier than in the countryside. 2) Socioeconomic status of athletes' childhood home, which affects the objects under scrutiny, is to some extent higher than that of the non-athlete control group.
3) Athletes consider that sport has promoted occupational career, both its onset and development. Although the majority of athletes thinks that sport has supported their occupational advancement, it is generally regarded as inhibiting attending school and studying. In addition to this, sport has been seen to demand sacrifices in such areas of personal life which are close to everybody (e.g. personal freedom and holidays). But on those fields of life where need for participation is recognized rather vaguely (e.g. cultural life), sacrifices for sport have

been experienced to a rather small extent. Different sport disciplines show differences in respondents' social background, education and occupational status. Disciplines reflect various social factors affecting various events. The divergencies show up in recruiting athletes to different disciplines from distinct social strata. This very consecutive finding indicates that there is constancy in the development of athletes' social status when recruitment base of representatives of certain discipline is the same.

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VUOLLE, PAULI, Sport as life content of successfull Finnish Amateur Athletes. Jyväskylä 1978. 33 p.
Reports of Physical Culture and Health 21.

The report presents research findings on Finnish male top athletes' education, occupation and family life in the span of life, time expenditure during active sport career, and their relations with sport career. The frame of reference is Festinger's theory of dissonance. The population was the most successful athletes in the Olympic years from 1956 to 1972. The results are based on surveys from 1972 and 1975.
Top athletes' educational level and occupational status have on the average been higher than in Finnish male population of respective age in general. Athletes consider that sport has restricted educational advancement more than occupational career. Sport has been regarded as demanding sacrifices in personal life. In the fields under scrutiny, there were differences between the beginning years, top period and retiring phase to some extent, but no marked differences could be shown between the different years. Changes were shown between individual and team athletes as well as the active and retired. The report summarizes the author's dissertation Urheilu elämänsisältönä. Menestyneiden urheilijoiden elämänura kilpailuvuosina [Top sport as content of life. Life career of successful athletes during active competitive period] - (Jyväskylä 1977). The dissertation and its supplementary report Suomalaisen huippu-urheilijan elämänura [Life career of Finnish top athletes] - (Jyväskylä 1976) focus on sport career of Finnish top athletes. The reports belong to the international research project initiated by the International Committee for Sport Sociology in 1969.

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* Information Service

HAAJANEN, Timo & SIKANEN, RAIJA, Bibliography on physical activity and sport behavior.
Jyväskylä 1975. 58 p. Reports of Physical Culture and Health 6.

The concept of physical activity and sport is defined from the viewpoint of behavioral sciences to mean active participation in and attitudes to leisure time physical activity and sport and involvement in and consumption of sport.

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* HAAJANEN, TIMO & VÄKIPARTA [VEISTOLA], MAARET, Evaluation in physical education: a selected bibliography.
Jyväskylä 1976. 70 p. Reports of Physical Culture and Health 15.

The bibliography has been constructed according to the themes of the International Congress of Physical Education "Evaluation" (FIEP, Jyväskylä, 28.6.-3.7.1976). The references cover some to general motor tests and to anthropometric measures of children at school age, in addition to references to school physical education. The material concerns only normal, non-retarded children; competitive sport as well as medical effects of school physical education are excluded.

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HAAJANEN, Timo & VEISTOLA, MAARET, Bibliography of school physical education: current references.
Jyväskylä 1978. 79 p. Reports of Physical Culture and Health 22.

The present bibliography has been compiled for a symposium on school physical education, held at Pajulahti Sports College, June 8-9, 1978. The symposium was organized for reports of current research projects in Finland. The Finnish and foreign references comprise, however, also other than research originals.

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